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ABSTRACT

These guidelines are intended to provide realistic and practical guidance about the options available to teachers and planners of education and training programs wholly or partly concerned with online information retrieval, particularly those in academic departments of library and information studies. Seven sections address: (1) the aims and scope of the guidelines; (2) possible reasons for teaching online information retrieval in both professional library and information studies education and user education; (3) the place of online information retrieval topics in the curriculum; (4) online information retrieval topics, including online services, databanks, full-text services, videotex, other electronic publishing, artificial intelligence and expert systems, in-house database development, marketing online services, online cataloging services and catalogs, policy and economic aspects, international issues and local problems, user education, and online information services as sources of information; (5) sample teaching programs for user education, continuing professional education, and basic professional education; (6) facilities for teaching online information retrieval; and (7) practical aspects of course planning and administration, including making teaching aids, planning practical sessions, setting up an online service for teaching, budget and administration, teaching methods, visits and visiting speakers, field work, and evaluation. Five appendixes include lists of English language journals, selected English language readings, and acronyms and abbreviations; resources for teaching information retrieval; and a glossary of terms used. (18 references) (CGD)

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Guidelines for teachers of online information retrieval

General Information Programme and UNISIST

United Nations Educational,
Scientific and Cultural Organization

Paris, 1988

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GUIDELINES FOR TEACHERS OF ONLINE INFORMATION RETRIEVAL

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Scientific and Cultural Organization

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FOREWORD

For many years, the General Information Programme of Unesco has been issuing a large number of guidelines to facilitate the development of national information systems in Member States - including libraries, information services and archives.

It is generally acknowledged that the best long-term investment for the development of adequate information systems is the education and training of information specialists. Many developed and developing countries are making tremendous efforts to provide suitable facilities for this purpose. However, while the provision of training facilities and teaching staff is the responsibility of national authorities, international assistance is often called upon for the production of teaching materials. The need for teaching materials has been voiced repeatedly in many areas for some time now and many documents in the field of education and training are available in several languages from Unesco (see the list at the end of this document).

To start with, it was necessary to propose documents of a rather general nature, such as general introduction, curriculum development, policy formulation and manpower forecasting. The time has now come to propose more specific topics such as the present guidelines for teachers of online retrieval.

General remarks have to be made concerning such documents.

First of all, as anyone involved in the process of education knows, teaching is a very personal activity which is determined by the educational environment, the students and the personality of the professor. A curriculum or a course on a given topic is the outcome of many interactions and the search for agreement among various experts results almost inevitably in endless debates. It is very important to note that guidelines in this series are documents which propose recommendations or directions but do not intend to impose any ready-made solution. It is only on the basis of local material and administrative circumstances, staff available, and of course an assessment of educational needs that a specific curriculum or course can be designed. It is hoped that the reader will keep this approach in mind when using this document.

For the same reason, authors are given general indications concerning the orientation of their contributions, but they are not required to observe, on minor points, absolute consistency with other documents in the series. The reader will certainly understand that such consistency would be artificial and that an author needs the intellectual freedom which goes with intellectual responsibility.

The use of online information retrieval services is now well established in most developed countries and is gaining more and more importance in the developing countries. Adequate training, both for initial and continuing education has thus become an absolute necessity for all categories of library and information services.

For the preparation of this document, the author could benefit from the active collaboration of the participants of the Unesco seminar on software packages for training information specialists and users. This seminar was organized on behalf of Unesco by the International

Association of Technological University Libraries, at Chalmers University of Technology Library in Göteborg, Sweden, from 24 to 28 August 1987. The twenty-seven participants who came from all parts of the world, brought together their wide knowledge and experience of this highly specialized and rapidly evolving area. It would be too long to name all of them, but Mrs Fjällbrant from Chalmers University Library, who was in charge of the organization of this meeting deserves a special mention. The report of this seminar is available upon request from Unesco.

The designations employed and the presentation of the material throughout these Guidelines do not imply the expression of any opinion whatsoever on the part of Unesco.

Any comments or suggestions for improvement or any report on the experience gained by other countries in using these Guidelines are welcome. Correspondence should be sent to the Division of the General Information Programme, Unesco, 7 place de Fontenoy, 75007 PARIS, France.

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1. INTRODUCTION

1.1 Readership

These Guidelines are directed at teachers and others who are involved in the planning and implementation of education and training programmes wholly or partly devoted to online information retrieval. Although aimed mainly at actual and potential teachers on such programmes, they should also be of value to those concerned with policy and planning.

The Guidelines are aimed at those involved in the design and implementation of new programmes and the modification and updating of existing programmes.

Their use is not restricted to those working any particular type of institution, however, the Guidelines contain much which is of particular relevance to academic departments of library and information studies.

The Guidelines cover programmes varying in level, duration and type but they do not deal directly with the training courses offered by database producers and online services.

1.2 Aim

The aim of these Guidelines is to provide realistic and practical guidance about the options available to teachers and planners of education and training programmes wholly or partly concerned with online information retrieval.

The Guidelines do not provide a blueprint to be used regardless of circumstances. It is emphasised that a careful analysis must be made of the particular circumstances and conditions which exist or can be created, before deciding to what extent and how the subject should be taught to any particular group.

The Guidelines are intended as aids to decision making. To this end they present a range of options together with a discussion of some of the factors which have to be taken into account by those making decisions.

Although good facilities for teaching online information retrieval are described in the Guidelines, much can be achieved with poorer facilities, especially if the teacher is determined to make the best possible use of the resources which exist. The teacher should, in these circumstances, also aim to improve facilities as opportunities to do so occur.

1.3 Scope

1.3.1 By subject

In the Guidelines online information retrieval has been defined very broadly so that it includes the retrieval of information from all types of online service, bibliographic and non-bibliographic (including full-text, factual, numeric, graphical and image banks) whether inhouse or remote.

Some knowledge of computers, telecommunications and information retrieval is necessary to understand online information retrieval, therefore relevant parts of these subjects are included.

To understand online retrieval it is essential to have some understanding of database creation so this is also included although it is such a substantial aspect of online that to give this aspect full treatment separate teaching programmes may also be needed. Online services are one form of electronic publishing. This is also considered in these Guidelines so that online information retrieval may be placed in the wider context. Finally, the management and policy aspects of online information retrieval are included.
Note: Definitions of the terms used here and online information retrieval terms from the rest of the Guidelines are included in Appendix IV.

1.3.2 By type of education and training

These Guidelines are concerned with the teaching of online information retrieval in three types of library and information studies education:-

1. Basic professional education

This is defined here as education which leads to a first professional qualification in librarianship or information studies. The qualification awarded may be, for example, a certificate, diploma, Bachelors' degree, Licenciatura or Masters' degree depending on the level and country. The level may be non-graduate, undergraduate, or post-graduate (graduate). Often the qualification is awarded by an educational institution (such as a University, other higher education institution or national academic body) or a professional association, and the teaching programme may be offered by a department of librarianship or information studies.

2. Continuing professional education

This is defined here as the further education of professional librarians and information workers by means of courses of varying duration, which they normally attend on release from their work. Some of these programmes have been shown also to be suitable for computer specialists, scientists and other who are involved substantially with online database creation, even though the courses were not designed specifically for them. This is an area of overlap with 3. User education.

Research for a higher degree by thesis, as a form of education, is not included in the Guidelines.

3. User education

This is defined here as the education and training of students and practitioners of subjects other than librarianship and information studies.

It should be noted that study of the education and training of students and practitioners of subjects other than librarianship and information studies is also considered in the Guidelines as part of basic and continuing professional education for librarians and information workers.

Note 1 Education and training

In these Guidelines education is taken to mean the general process of instruction with particular emphasis on the more intellectual aspects, whilst training is considered to refer particularly to the gaining of practical skills and basic facts.

Note 2 Teacher

Those teaching online information retrieval are called teachers in these Guidelines even though in many higher education institutions they are called lecturers. There are two main reasons for this:-

1. The Guidelines are applicable to programmes run in a wide range of institutions, not just to higher education.

2. The term lecturer does imply a rather narrow approach to methods of teaching, that is, just lecturing.

1.3.3 Practical considerations

A distinctive feature of remote online services is that they are not yet available in all countries and that even if they are available they may be expensive and unreliable. These facts create difficulties for teachers and the Guidelines aim, at least in part, to show ways in which these can be minimised.

Another important feature of online information retrieval is the speed with which changes are taking place. Teachers and students both need to be prepared for change. The Guidelines themselves will date but efforts have been made to avoid detail which will date quickly. Appendix II, the selected readings, will be the section to date most quickly but the list of journals (Appendix I) is intended to compensate for this by giving a list of sources from which updated readings can be obtained.

1.4 Overview of the Guidelines

The rest of this publication is divided as follows:-

Section 2 presents reasons for including online information retrieval in different types of teaching programmes.

Section 3 considers the place of online information retrieval in the curriculum.

Section 4 outlines a range of topics which can be included in the broad area of online information retrieval together with some of which it is essential to have some knowledge, to be able to understand online information retrieval.

Section 5 gives examples of curricula and programmes for a wide range of user education, continuing education and basic professional education programmes which can be built up from the course modules outlined in Section 4.

Section 6 describes teaching and other facilities for online information retrieval teaching.

Section 7 discusses the many practical aspects of course planning and administration for teaching online information retrieval.

Appendix I: English language journals relevant to this subject area. Journals are especially valuable sources of information for both teaching staff and students in such a rapidly developing subject. This list will need to be supplemented by the addition of appropriate non-English language journals, especially in countries where English is not the first language.

Appendix II: Indicative English language readings arranged in the same order as the modules in Section 4. These are intended for both teachers and students. These readings will need regular updating and in many countries supplementing with readings in other languages.

Appendix III: This gives examples and lists sources related to Sections 6 and 7. It is intended mainly for teachers.

Appendix IV: A glossary of online information retrieval terms used in the Guidelines

Appendix V: A list of acronyms and abbreviations which are used in the Guidelines but which do not appear in Appendix IV.

The UNESCO General Information Programme and UNISIST have produced many related publications some of which are referred to specifically in these Guidelines. Others may be traced by consulting the following documents:-

Lermyte, C and Philippon, B. (1985) Awareness list of principal documents and publications of the General Information Programme Paris, UNESCO General Information programme and UNISIST (PGI-85/WS/25) (English version 1987).

United Nations Educational, Scientific and Cultural Organisation List of documents and publications of the General Information Programme and UNISIST: Supplement 1984-1986 Paris, UNESCO (PGI-87/WS/8) (In English, French and Spanish).

2. POSSIBLE REASONS FOR TEACHING ONLINE INFORMATION RETRIEVAL

It is essential to think clearly about the reasons for introducing any topic into the curriculum. Because of this, the reasons given below merit consideration. They provide a basis for making decisions on the introduction of one or more aspects of online information retrieval into any curriculum and for the preparation of objectives for each component included.

2.1 In professional library and information studies education both basic and continuing

2.1.1 It is an essential component of modern professional education

1. This subject should be taught because online information retrieval has revolutionised many aspects of information provision and has serious implications for the availability of information throughout the world.

2. At some stage in their careers participants may use online information retrieval services, may be responsible for developing or managing such services and may be able to influence, plan or execute local, national or international policy in this area. Therefore, they need a sound understanding on which to base their work. They must also be capable of, and have the means, to update what they learnt during basic professional education. This clearly is the reason for continuing education and training in this field.

3. Some participants may never have the opportunity to work with online information retrieval services but even so they need sufficient understanding of this area to be able to place local and national information provision in the wider international context and to work for appropriate changes.

4. Computers are being used increasingly in business and other fields throughout the world and libraries and information services which do not use computers will be viewed as old fashioned. Therefore, it is important that librarians and information workers should be educated in such a way that informed decisions can be made about the appropriateness of the introduction of online information retrieval and other computer applications into such services.

5. Those in less developed countries should not be given a 'second class' professional education by omitting online information retrieval from the curriculum. It should however, be taught at an appropriate level for the particular students, and to suit the circumstances. Informed decisions on these matters should be taken by those most concerned with the teaching programme including teachers, representatives of

the library and information professions and students, if they are sufficiently knowledgeable. It should be remembered in reaching these decisions, that some students and qualified librarians and information workers are highly geographically mobile which is an additional reason for providing an education acceptable in international terms.

6. Those attending continuing education courses or meetings are likely to be more senior staff who can bring valuable experience to the programmes, thus making a major contribution to their success by ensuring that an exchange of experience benefits other participants.

7. They may already be in a position to influence or make management or policy decisions and they may already using or soon be required to use, online information retrieval services, thus being in particular need of updating in this area.

2.1.2 To teach practical skills

1. Actually working with online services increases understanding of them.

2. Practical skills may be needed in the participants' careers. Skills such as database construction or searching are skills like cataloguing, and should be taught.

3. Those who have to supervise those doing online work will be better able to carry out that role if they have had actual 'hands-on' experience.

4. Practical online information retrieval work provides good and realistic experience of using computers in general. This skill is likely to be needed by most professional staff in future.

5. The basic skills should be taught so that a proper understanding of the principles can be gained.

6. Whilst, in normal circumstances, it is not considered necessary, or desirable, to train students to be experts in the use of particular software or services (since this is considered to be the role of the suppliers whose training courses are not specifically included in these Guidelines), there may be circumstances in which this training has to be provided.

7. Often those attending continuing education or training have some theoretical knowledge but lack practical experience. Practical 'hands-on' experience is important because it enhances understanding.

Note: Special care needs to be taken in planning practical work so that those in senior positions see the relevance of

it to themselves, and can undertake it without actual, or perceived, 'loss of face'.

2.2 User education

The level of user education provided will vary widely depending mainly on the facilities and financial resources available and on policies and attitudes. One reason for user education in this field could be to increase the use of online information retrieval. This applies particularly to much of the training done by online hosts and database producers but it can also be a reason for others who consider that online resources are under-utilised nationally or within the organisation. Apart from this, the reasons for providing user education vary with the level of education provided.

2.2.1 Database building

1. Users (practitioners such as scientists or computer specialists) may be taught to design and build databases. This clearly can have many advantages within organisations and countries where such practitioners are doing this work. However, such courses are outside the scope of these Guidelines, except to the extent that the design and building of databases is covered in librarianship and infomation studies (LIS) continuing education courses which other practitioners may attend.

2. Users may be taught to build personal databases using proprietory software. One justification for this could be to ensure that information of value to the organisation as well as to the individual is properly kept. It may also be considered desirable to standardise by using a limited range of software within an organisation. This topic is within the scope of the Guidelines only to the extent that it is included in courses covering online information retrieval.

2.2.2 When online facilities are available within the organisation

1. Users may be taught to do all their own online searching leaving the intermediaries to act as expert advisors and to administer the service. The justification for this is that users are the best judges of what they want and have the best subject knowledge. However, users may find it difficult to remember and keep up with changes in the details of online services. They may also be less cost conscious.

2. Users may be taught to do simple subject searches. This enables the user to carry out simple searches on perhaps just a few databases on only one or two hosts and to leave more difficult searches or those requiring use of other databases or hosts to intermediaries. Again one justification is that users are the best judges of what they want and have the best subject knowledge. Having this level of knowledge enables users to judge better which searches are best done manually

and which best done online. It may also enable the user to prepare searches better which are to be carried out by an intermediary.

3. Users may be taught which topics are best handled manually and which are best done online and how to prepare topics for the intermediary. The justification for this level of teaching is that it can save the intermediary's time and the organisation's money.

4. Users may be taught what online searching is, when it should be used and what facilities are available both in the organisation and more widely. This level of teaching should give users an awareness of online searching, when it is appropriate to search online and of the facilities available to them.

2.2.3 When online facilities are not available within the organisation

Users may be taught about online searching and its availability outside the organisation. Reasons for this level of teaching include attempting to gain support for the introduction of online facilities in the organisation and educating those who may go to work in organisations which have online facilities.

3. THE PLACE OF ONLINE INFORMATION RETRIEVAL TOPICS IN THE CURRICULUM

This section relates especially to basic professional education programmes whether nongraduate, undergraduate or postgraduate. The actual content of the programme, of course, will vary depending on the level and duration of the course as well as on other factors (see section 7.1).

It is assumed that continuing education courses will be of a more specialised nature and shorter duration, so that their planning will be more concerned with course design than with more complex aspects of curriculum development. User education courses similarly, are unlikely to be so extensive and wide ranging as programmes of basic professional education. Therefore, the remainder of Section 3 concentrates on basic professional education programmes whether they are new programmes or revisions of existing programmes.

Note: In these Guidelines 'course' is used to denote one of a series of modules which together make up an educational 'programme' at whatever level.

Basic professional education programmes are assumed to consist of several required courses together with a number of elective courses. In some cases, each student may also be required to do an individual project or dissertation.

Online information retrieval is not a self-contained topic, it depends on, and contributes to, an understanding of a whole range of topics as Section 4 illustrates. Therefore, it is acceptable, even desirable, that aspects are distributed widely within teaching programmes. An examination of some recent actual or model teaching programmes for example, Large (1987); Saunders (1985) and Huthluff (1985) shows no evidence of any move to introduce separate courses covering the range of topics outlined in Section 4.

The structure of teaching programmes and the scatter of topics included in online information retrieval as interpreted in these Guidelines is illustrated in the next section which also serves to illustrate the developments in this field over the last ten years.

3.1 Three examples of curricula

1. The model curriculum for information studies outlined by Saunders (1978) has a 'core' consisting of courses on human communication, user studies, sources of information, information/data storage and retrieval and organisational aspects, plus some elective courses and a dissertation. In this curriculum, aspects of online information retrieval could be included in all areas except perhaps, the first. Saunders, however, only specifically mentions them as "searches of computer data bases" in the Sources of Information module and "computer methods" in the

Information/data storage and retrieval module. It is fair to say that had Saunders been preparing this curriculum now he would have placed greater emphasis on computer applications, including online information retrieval, but even as it stands the curriculum he outlines provides a sound basis for planning.

2. The modular curriculum in information studies produced by Large (1987) consists of twelve required modules:-

C-01 Information in its social and communications context
C-02 Information users
C-03 Quantitative methods
C-04 Research methods
C-05 Information sources
C-06 Information storage and retrieval systems
C-07 Information services
C-08 Electronic data processing
C-09 Applications of information technology
C-10 Telecommunications and networking in information systems
C-11 Management of information systems and services
C-12 Economics and marketing of information

and four electives selected from the following (with others depending on the expertise and interest of the teachers):-

E-13 Design of computer-assisted information systems
E-14 Sectorial/subject oriented information sources and systems
E-15 Planning and design of buildings and facilities for information centres and libraries
E-16 Online searching
E-17 Health and welfare library and information services
E-18 Agricultural library and information services
E-19 Audio-visual studies
E-20 Printing, bookbinding and conservation.

Of these C-05, C-06, C-07, C-08, C-09, C-10, C-11, C-12, E-13, E-14, E-15, E-16, E-17, E-18, E-19 and E-20 all contain aspects of online information retrieval in the broad sense considered in these Guidelines.

3. The ISTIC (Institute of Scientific and Technical Information of China) Postgraduate Course in Information Studies, China (as described in Saunders, 1985) is an example of an actual teaching programme rather than a model curriculum. In it online information retrieval topics are distributed as follows:-

Searching of online bibliographic and nonbibliographic sources and the range of sources available is included in the Information and Data Sources course.

The management of change is in the Management of Information Systems and Services module.

Aspects of input and record formats are in the Organisation of Information and Data Source Materials course.

Information flow and service design are in the Information and Data Organisations and Services module.

Marketing, economics and international aspects such as transborder data flow are in the Marketing and Economics of Information course.

Computer aspects including online systems, networks and DBMS systems are in the Electronic data processing and Telecommunications and Information Technology and its Information and Library Service Applications courses.

Descriptions of different types of database systems are in the Information systems: analysis and design module.

3.2 In which courses should online information retrieval topics be included?

The location of particular topics within programmes should depend to some extent on the availabilty of online services. For example, if both methods are available it seems appropriate to include online searching of sources of information in the same course as manual searching of the same or similar sources so that they can be compared.

Often programmes have one or more computer courses and some hardware, software and telecommunications aspects can be included in these. However, it is probably good practice to minimise this and to try to include as much as possible in other more applications oriented courses. For example, it can be appropriate to include topics such as online cataloguing services in a cataloguing course and free text retrieval systems in an information retrieval course whilst management aspects can be included in a management course.

A major practical consideration in deciding on the location of particular aspects of online information retrieval in the teaching programme is the competence of members of staff to teach them. This may be the main reason for the distribution of online information retrieval topics between courses. It is worth remembering, however, that it is often possible to arrange for a member of staff to teach in a course largely taught by another.

3.3 Teaching implications of the scatter of online topics

There is clearly a need to keep a careful check on the coverage of particular topics to ensure that they are not omitted or, less importantly, duplicated. Care needs also to be taken to ensure that new topics are inserted in appropriate courses as necessary. This means that the teachers of the different modules need to liaise so opportunities for staff to meet each other are important.

Formal staff meetings are likely to be necessary in addition to informal meetings.

Efforts should be made by all teachers to ensure that the students see the relationships of topics taught in different modules.

4. ONLINE INFORMATION RETRIEVAL TOPICS

This section contains outlines of topics which can be considered to be related to online information retrieval. The relationships between these subjects, and between these subjects and others not outlined here, are complex, so that a single linear sequence is inadequate to show their relationships. The order in which those topics selected for inclusion in any course are arranged is likely to differ from that shown here. An attempt has been made here to start with the simplest or most fundamental although some teachers may prefer to start with Section 4.10 Inhouse database design construction and use. In most teaching programmes some of the topics outlined will be included in broader courses.

Outlines are provided for basic courses in computers and telecommunications and information retrieval (Sections 4.2 and 4.3) even though some teachers may consider that these are simply prerequisites for teaching online information retrieval. Care must be taken that any courses specified as prerequisites are compulsory not elective.

Although topics are suggested the actual content of the teaching is not, since any teacher must know the subject sufficiently to be able to prepare lectures or other teaching sessions. Items from the selected readings which form Appendix II may prove helpful to novice lecturers although they do not cover the topics evenly or comprehensively. Citations in this Section are to items listed in the Appendixes II and III.

Teaching methods are suggested but it must be stressed that these are only indicative. The choice of lectures, seminars, small group work or other form of teaching depends on the nature of the material to be covered and the educational background and level of the students. In general, lectures enable the teacher to cover a great deal of factual material quickly, seminars based on student presentations (in turn based on reading) may be useful for discussing more controversial subjects and to encourage students to think for themselves, whilst small group teaching is especially helpful for complex subjects where individual guidance may be needed. Professional education should stimulate the critical faculties of those being taught, and so it is unwise to rely entirely on lectures and set textbooks (which encourage rote learning) whatever the educational methods to which the students have previously been exposed (see Section 7.8).

An indication of the amount of time needed for each topic is given, although this will vary a great deal depending on the total duration of the teaching programme, the other subjects to be taught, the level at which each subject is taught, the previous knowledge of the students and the facilities available. The timings given are middle range indications since it is possible to run these courses with shorter or longer durations, as the examples in Section 5 illustrate.

Subjects which must be understood before online information retrieval can be comprehended are also included in these outlines. Apart from a sound education and a knowledge of basic librarianship and/or information work, knowledge of these topics are the only prerequisites for understanding online information retrieval. However, to do practical online work, it is helpful if students already possess keyboard skills, whilst for anything more than simple subject searching, actual knowledge of the subject is an advantage.

Participants whose first language is not English may find it difficult to work with English language databases. This may mean that extra time has to be devoted to this aspect. In countries where the first language is not English (and especially those which use scripts other than roman) some time should be spent in studying the implications of this in relation to the use of information technology.

Note:

1. Most remote databases are in English. To use them properly a good knowledge of the English language is needed. In addition, appropriate thesauri, dictionaries and other tools to assist in the choice of both controlled and natural language terms are needed.

2. In the sections headed Time required, non-practical work includes lectures, discussion, seminars and case studies and any other forms of non-practical teaching which may be used for a particular topic. Visits are not included in the times given for either non-practical work or practical work since they are so variable.

4.1 An introduction to online searching

This is intended as a basic introduction. It can be omitted for those with some knowledge of online IR. However, some participants, even though they know something about the topic, appreciate a clear explanation of online, especially if it is to be followed by practical work of which they have little experience.

It may be the only teaching about online IR which is given. Therefore, this outline includes topics which, if a longer time is available, it may be considered more appropriate to include elsewhere. Whilst this outline concentrates on online searching of remote databases, it can be adapted to deal with online searching of inhouse databases or broadened to cover searching both external and internal databases.

4.1.1 Objectives

1. To introduce the concept of online information retrieval.
2. To define the components needed for online IR and to describe them
3. To illustrate the range of databases and services which are available.

4. To discuss the advantages and disadvantages of online searching.
5. To show a simple search.
6. To discuss the economics of online searching.

After the sessions students should know:-

-what online searching is

-the advantages and disadvantages of online searching

-what equipment is needed

-how to do a simple search of a bibliographic database

-what costs can be involved in online searching

-some basic commands for the service used

4.1.2 Outline

Definition of online information retrieval. Explain how the majority of databases originated (and mention exceptions such as AGRIS). INSPEC is a nice example of the production of online databases as a by-product of the computerisation of secondary services because it shows the range of other by-products as well, such as SDI, standard profiles and magnetic tapes. Show the growth in the numbers and use of online bibliographic databases and their subject distribution (Hall, 1986). The information industry.

Reference and source databases can by distinguished and other forms of electronic publishing mentioned if it is felt necessary to place online bibliographic searching in context.

The equipment needed can be defined and described. Advantages and disadvantages of searching online. What makes a topic suitable for online searching. A simple search (it is often helpful to use overhead transparencies as a first stage) which, if no practical work is possible, can be followed by a tape/slide presentation. Costs of searching. Importance of good libraries and document delivery services

4.1.3 Teaching methods

Lecture, discussion, practical work.

4.1.4 Practical work

Depending on what is available, a demonstration of online searching (live) followed by use of a simulation of online searching and then live hands-on searching would give good experience. A short online search which students prepare and run and which is based on their own interests (or those of friends or relatives) is usually effective but, if that is not considered appropriate, set searches can be prepared. A search for a real enquirer, as described in 4.4.3 gives excellent experience but this is time consuming and expensive.

It may be possible to use the facilities, such as free online time and help with training, offered by hosts and database producers.

4.1.5 Time required

Non-practical work: 2 hours. Practical work: (per student) demonstration 1 hour, simulation 2 hours, live hands-on experience 1 hour of which 20 minutes is hands-on for the student.

4.2 Computer and telecommunications basics relating to online information retrieval

It is expected that in basic professional education, these topics will form part of a broader Computers and Telecommunications course. How much is included in a continuing education programme depends on the programme, but these are fundamental topics which all who are involved in the field need to know and understand. In end user education, probably only the simplest explanations will be needed, and then only of selected aspects.

4.2.1 Objectives

To provide the technical and theoretical background necessary to understand online information retrieval.

After these sessions students should know

-what a computer is

-the differences between serial and inverted files

-the differences between free text and database management systems

-the advantages and disadvantages of DBMS and FTX systems and what they can be used for in a library or information service context

-some criteria for the evaluation and selection of software and hardware

-how to use FTX and DBMS software in a simple way (if the practical work can be done)

-the difference between analog and digital signals and different physical means of transmission

-what packet switching is and what the components of a packet switched network are

-what networks, including local area networks are

-something of international standardising activity in telecommunications and its significance

4.2.2 Outline

Computers:- What a computer is, for example hardware, software, peripherals, etc. Computer retrieval via serial and inverted files. An explanation with examples, of free text and data base management systems (hierachic, network but especially, relational DBMS). (Consideration of some UNESCO and other software especially designed for less developed countries, in addition to the major commercial software packages, is likely to be appropriate). Discussions of the advantages and disadvantages of both types of system especially in relation to text handling. Evaluation. Uses to which they may be put in libraries and information services.

Telecommunications:-telegraph, telephone, Strowger (mechanical) telephone exchanges, digital and analog signals modulation, bandwidth, parity, duplex, transmission speeds, modems, packet switching, networks of different configurations, local area networks (LANs), gateways, standardardisation and its importance in this field (X25,et from the Comite Consultatif International de Telegraphie et Telephonie (CCITT), ASCII, EBSIDIC and ISO (OSI Open System Interconnection), coaxial cables, optical fibres, satellites and their impact on data communications. The relationships of the above topics to, and their implications for, online information retrieval should be emphasised. The theory should only be taught to the extent that is absolutely essential for understanding.

4.2.3 Teaching methods

Lectures, discussion, practical work, visits to a computer centre, national telecommunications centre and to an organisations with inhouse online services both FTX and DBMS.

4.2.4 Practical work

Work with free text systems, DBMS systems and online services, if available. Some systems show some of their workings, for example, on MIRABILIS it is possible to see the postings file when re-indexing. Error messages from telecommunications networks can be explained.

4.2.5 Time required

Non-practical work: 12 hours. For students with some knowledge of computers - 4 hours on the computer aspects and 2 hours on the telecommunications aspects can be adequate. Practical work: 9 hours per student if FTX, DBMS and online services are all available.

4.3 Information retrieval basics relating to online information retrieval

It is expected that, in basic professional education, these topics will form part of a wider course on information retrieval. Some aspects may need to be covered in continuing education courses, even if they are presented as a form of "revision" of what the participants know already. Users may need clear explanations of some topics but not coverage in great depth.

Note

1. If there is no expert systems course offered to all students, an explanation of expert systems should be included in this course together with a clear statement of the differences between the information retrieval systems and expert systems. It may be considered preferable to include an introduction to expert systems in this course even if a separate course is available, especially if the expert systems course is an elective course. Some examples from the information field (see Section 4.9), should be described such as PLEXUS (now the basis of the TOME SEARCHER software).

2. It may also be considered desirable to include study of DBMS and free text retrieval systems in this course rather than the computer basics course 4.2.

4.3.1 Objectives

To explain the theory behind online information retrieval.

After these sessions students should:-

-understand Boolean and other search techniques

-be clear about the formal measures of retrieval performance (recall, precision, etc.)

-know about record formats and have studied some examples

-understand the basics of indexing and controlled and natural language searching

-know how to construct some searches using a particular command language or languages, how to download or run SDI profiles (at a basic level) and how to prepare and input straightforward records to a particular database or databases depending on the practical work which is done.

4.3.2 Outline

Boolean and other search techniques such as weighting, relevance feedback, best match with ranked output. Recall, relevance, precision, specificity, relative recall (as a practical measure). Record formats, data elements, fields, tags, indicators, bibliographic level. Study of some important record formats such as MARC, AGRIS, MEDLINE and the various international exchange formats (see reading). Indexing, post and pre co-ordinate; thesauri and controlled language searching. Natural language searching. Language barriers in online searching. Study of examples of records available online and the implications of their forms for searching. Phrase indexing and word indexing.

4.3.3 Teaching methods

Lectures, discussion, practical work, visits to input centres, for example, a regional AGRIS centre.

4.3.4 Practical work

Constructing (and, if possible, running) some searches using Boolean logic and exploration of the record structure and any searching facilities available (for example searching by title, descriptors, authors, corporate source, with word adjacency and truncation). Preparing input using particular formats (such as MARC, AGRIS and MEDLINE). Constructing a thesaurus for a defined narrow subject.

Note:

Working with English language databases may be difficult for students whose first language is not English. Extra time may be needed to teach this.

4.3.5 Time required

Non-practical work: 8 hours (for students with some knowledge 2 hours can be adaquate to relate what they know already to online searching). Practical work: 6 hours per student is sufficient to construct and run searches and to input records to a database. Thesaurus construction is in addition to this and unsupervised.

4.4 Searching using online services

This covers straightforward bibliographic searching in more detail. It should only be taught if there is some prospect of the participants being able to use online services of some kind fairly soon. For end users only those sections which relate especially to them need be included.

4.4.1 Objectives

1. To study the role of the intermediary and the specific tasks he or she carries out.
2. To study end user searching.
3. To study some of the more advanced facilities offered by hosts and databases.

After these sessions students should:-

-be capable of dealing with enquirers, constructing real search strategies, running them online, evaluating the results and presenting the results to enquirers in a suitable form. The practical work is essential to achieve this objective.

-know more about online services and their use as indicated in 4.4.2

4.4.2 Outline

Background given in 4.3.1 should be included or treated in greater depth as appropriate. The search interview (or reference interview) -how to establish what an enquirer wants. Building a user profile. Aids to online searching-some

examples of database search guides and how to use them, host guides, newsletters, thesauri. Search strategy construction (more advanced than indicated in 4.1 and 4.3) including special features of particular hosts or databases, citation searching, host interconnections, SDI from online databases and, if appropriate, comparisons of command languages. Discussion of studies of searcher behaviour and the man-machine interface, uploading, intelligent front ends and gateways such as CanSearch and Easynet and their increasing importance, search output including downloaded records and their use, presenting the search results and search evaluation. End user searching and services for the end user (e.g. After Dark, Knowledge Index, Medical Connection).

Note:

4.14 User Education outlines a course to teach students how to teach users and about user education as distinct from an account of the present extent of end user searching and end user behaviour (to which it is clearly related).

4.4.3 Teaching methods

Lectures, role playing, videoed reference interviews, practical work.

4.4.4 Practical work

A good piece of practical work is for students to do an online search for a real enquirer especially if it is compared with a manual search of the same topic but this is often not feasible. Knowledge of the subject area in which the search is undertaken is advantageous.

Other possible practical work is described in Section 4.1.4. If simulations of two or more hosts are available, these can be used for a practical comparison of command languages. Otherwise this exercise is probably best carried out using manuals although it can be done online without being too expensive if the exercise is carefully prepared in advance by the teacher. Inhouse databases can be used in comparisons if they are more readily accessible than remote hosts. Actual search construction for set topics (and if possible running searches) is be a useful exercise to test if students understand the topic.

It may be considered necessary to provide in-depth training in the use of a particular host or database. Hosts and database producers may help with training.

4.4.5 Time required

Non-practical work: 12 hours (for experienced participants an overview can be provided in 2 to 4 hours). Practical work: the real online search if compared to a manual search (which takes most of the time) takes each student about 12 hours of which 2 hours is tutored practical (including up to 1 hour online); comparisons of hosts, downloading and other practical can take up to 6 hours.

4.5 Databanks

All those in professional education (at any level) should know something about non-bibliographic databanks and some parts of the topic as outlined below can be used as considered appropriate. Specific databanks in particular subject areas, should be discussed in the relevant bibliography or resources course (see courses in 4.17). If, as is likely in a continuing education course, there is no specific bibliography course, it is important to describe examples in subject areas relevant to the participants (especially those databanks in, or accessible from, the country) in this course. Image banks should be included.

End users need to know about the databanks in their own subject rather than about databanks in general. They should already be aware of the importance of data in their own subject area but they may not be aware of the many different sources of several types, (databooks, databanks, journals, secondary publications, full-text services, etc.) from which data may be retrieved and these should be described to place online databanks in context.

4.5.1 Objectives

1. To define numeric data and explain its importance in some subject areas, especially in science, technology and the social sciences.
2. To compare online databanks with other means of handling numeric data.
3. To show, by means of examples, some of the facilities online databanks provide and some of the difficulties which may be encountered in their use.
4. To assess the role the staff of libraries and information services might play in relation to online databanks in particular circumstances.
5. To describe the way images are dealt with by computer and to illustrate this with appropriate examples.

After these sessions students should:-

- -know what databanks are and how they differ from bibliographic databases
- -know of some appropriate examples and how the data is handled in them
- -understand the importance of some types of data (especially for development)
- -be aware of the potential and problems databanks present to libraries and information services
- -know how to do simple searches in one or more databanks. This depends on being able to do the practical work.
- -to know about appropriate image banks and the way images are handled by computer

4.5.2 Outline

Definitions of data, examples of data from different disciplines (e.g. observational, experimental and evaluated). Importance of data in some areas especially science, technology and social sciences. Importance of the conditions under which the data were collected. Sources of data (to put databanks in context). Activities of CODATA.

Definitions of databank, numeric or fact database, numeric database system (Luedke 1977) source databases compared to referral databases, hybrid databases (data plus bibliographic references). Definition of image bank.

Numbers of factual compared to bibliographic databases and comparative volumes of use (if up to date figures are available). Cuadra's Directory of online databases may have some figures.

Some examples of databanks of different types (if possible use some which are available in the country). Other examples could be CAS Online (hybrid), RTECS (Registry of Toxic Effects of Chemical Substances) (hybrid), ICC British Company database, CODUS (electronic components databank), mass spectra, GENBANK (gene sequences), protein sequence databanks, census data, Datastream and/or the databanks described in the reading. Some data is now distributed on floppy disc (e.g. the HMSO Business Monitors). ESDU (the Engineering Sciences Data Unit) distributes data on floppy disc together with the programs to manipulate the data for design purposes. CD-ROM use.

Features which databanks may have (such as graphics, manipulation of data and tabulation) and problems of using them, for example, the tendancy to have unique, non-user friendly command languages, need to know the subject.

Databanks tend to be used by the end users who have the subject expertise, need to use only one or two databanks, and use them frequently, so the role of the library or information service should be discussed in this context (Bartkus 1982). Bartkus does not consider information specialists building databanks, but it might be appropriate to mention this and to include consideration of the practical aspects in section 4.10. Similar topics should be covered for image banks.

4.5.3 Teaching methods

Lectures, discussion, seminars, visits, practical work.

4.5.4 Practical work

If available, demonstrations of online databanks and, if possible, hands-on experience.

4.5.5 Time required

Non-practical work: 4 hours (with experienced participants 2 hours can be sufficient). Practical work: 2 hours (1 hour each for demonstration and hands-on practical work) per student.

4.6 Full-text services

There are fewer full-text services than bibliographic services but their numbers are increasing. At the present time it may not be necessary to give as much emphasis to full-text services as to bibliographic ones. However, all those in professional education at any level need to know that they exist and, if some full-text services are accessible in or from the country, they need to know about them.

End users only need to know particular services in depth if there is the possibility of access to them and they are in appropriate subject araes. However, it is important that end users know the range of facilities which exist and this includes the full-text services.

4.6.1 Objectives

1. To define and describe full-text services and to compare them with bibliographic databases and databanks.
2. To study retrieval from full-text. Its special advantages and difficulties.
3. To look at some examples of full-text services.
4. To consider possible future developments.

After these sessions students should know:-

-what full-text services are and how they differ from bibliographic services

-of some relevant examples

-the advantages and problems of searching full-text and some of the special features that have been introduced to aid searching

-how to do simple searches on one or more full-text services. This depends on the practical work being done.

4.6.2 Outline

Definition (whole text of document searchable). Usually hard copy available as well as online form (that is hybrid services). Note: Not considering in this section fully electronic journals such as those in the BLEND project (see Section 4.8. Can be journals or books such as encyclopedias.

Describe some examples, e.g LEXIS (a legal service produced by Mead and one of the earliest full-text services), the American Institute of Physics and American Chemical Society primary journals (all of which are available for searching on at least one online service), the Harvard Business Review (a major management journal available full-text on at least on online host), Kirk-Othmer's Encyclopedia of Chemical Technology (a multi-volume encyclopaedia available on several online services), POLIS (the UK Parliamentary information service, only available online), Hansard in Canada, etc.

Discuss advantages and problems of searching, including problems of photographs and graphics (see reading list). Special search features such as occurrence tables and highlighting terms in context which are intended to facilitate searching. The possibilities for publishers. The future - CD-ROM publication?

4.6.3 Teaching methods

Lectures, seminars, discussion, practical work.

4.6.4 Practical work

If available, demonstrations of searching and, if possible, hands-on experience.

4.6.5 Time required

Non-practical work: 2 hours. Practical work: 2 hours (1 hour each for demonstration and hands-on work) per student.

4.7 Videotex

Although interesting as a different form of online information retrieval, videotex systems do not merit a great deal of attention unless there are systems in the country (either national or within organisations) or their introduction is planned.

If there is videotex within the country, relevant readings (if available) should be added to the reading list).

4.7.1 Objectives

1. To introduce the different forms of videotex (teletext and interactive videotex) and discuss their value as media for information dissemination both nationally and within organisations.

After these sessions students should know:-

-what videotex is, what are its different forms and how they work

-some relevant examples

-the advantages and limitations of videotex for particular purposes

-how to search for, and input information to, a particular system or systems. This depends on the practical work being done.

4.7.2 Outline

Definitions of videotex, interactive videotex (viewdata) teletext (broadcast videotex) and explanations of how they work. To study implementations in different countries.Retrieval methods and limitations. Graphics (alphamosaic and alphageometric). Suitability for naive users. Particular uses e.g. sub-titles for the deaf, home shopping and banking. Inhouse systems advantages and

disadvantages compared to other information retrieval systems.

4.7.3 Teaching methods

Lectures, seminars, discussion, practical work, visit to an organisation with an inhouse videotex system or which has access to the national system (if any).

4.7.4 Practical work

If available, demonstrations and, if possible, hands-on experience. Preparing input gives a useful insight into the capabilities of the system.

4.7.5 Time required

Non-practical work: 2 hours. Practical work: 3 hours per student (1 hour demonstration, 1 hour searching and 1 hour input).

4.8 Other electronic publishing

The extent to which this area is covered depends, to some extent, on the level of the students but it is a likely topic for continuing professional education, especially the study of the policy implications of developments in electronic publishing. Apart from CD-ROM and electronic mail, if they are available in the country, this is a less important area for end user education. It is however, a rapidly changing area and its place in a teaching programme needs regular review.

4.8.1 Objectives

1. To study recent developments in alternatives to conventional generation, capture, storage, ordering, retrieval, transmission and delivery of documents.
2. To consider the implications of these developments for libraries and information services in countries at different stages of development. (There is an overlap with the discussion of policy implications outlined in course 5.14 and course 5.15 which would need to be resolved in course design).
3. To place online information retrieval in the broader electronic publishing context.

After these sessions students should know

-about electronic methods of document generation, capture, storage, ordering, retrieval, transmission and delivery

-about the implications of their use for the availability of publications worldwide

4.8.2 Outline

Electronic generation of documents:- for example fully electronic journals such as the experimental journals of the BLEND project with direct author input, online editing and refereeing, online reading, reviewing and content amendment.

Problems and implications. (It may be appropriate to consider electronic mail systems at this point especially if in-house, local, national or international services are becoming available).

Electronic document capture:- from typesetting tapes (the problems should be highlighted), word processing, multifont optical character recognition (OCR) and digital electronic scanners. How they work and their advantages and disadvantages.

Electronic document storage:-magnetic tapes, magnetic discs, videodiscs including CD-ROM and WORM, and other media which become important. How they work and their advantages and disadvantages. Interactive videodisc (the Domesday Project). Experiments such as ADONIS.

Electronic document ordering:-Dialorder, Arrtel.

Electronic document retrieval:- this will have been adequately covered by the rest of the course but can be placed in context here.

Electronic document transmission/delivery:- teletex (character coded) and facsimile (fax)(image coded). Use of satellites. Relationship to online retrieval.

Discussion of the implications of these developments on an national and international scale.

4.8.3 Teaching methods

Lectures, seminars, discussion, visits.

4.8.4 Practical work

Little can be suggested. If electronic mail is available it can be used. It may be possible (with a suitable office automation system, for example) to set up an article to demonstrate the some of the problems of reading online. The full-text services on some of the major hosts could be demonstrated. It may be possible to show students (perhaps on visits) CD-ROM, fax, etc.

4.8.5 Time required

Non-practical work: 6 hours (less for knowledgeable professionals). Practical work: 4 hours depending on the facilities available.

4.9 Artificial intelligence and expert systems

It is important that students should appreciate the differences in approach between expert systems and information retrieval systems. This should be explained and shown in any artificial intelligence and expert systems course given as part of a librarianship or information studies programme or, if none is offered, or if it is only offered as an elective, in the Information retrieval basics course (4.3). It is considered appropriate to include intelligent front ends and gateways with other aids to searching in a course such as 4.4 Searching using online services but they should also be mentioned in this course. Expert systems for providing information, such as PLEXUS are included in this course but, if a course such as this is not

offered, then they should be included in an information retrieval course such as 4.3.

4.9.1 Objectives

1. To introduce students to expert systems, using at least some examples from an area with which they are familiar.

2. To describe and discuss developments aimed at making searching easier either by use of intelligence added to a retrieval system or by means of an expert system.

After these sessions students should know:-

-what an expert system is

-some approaches to expert system design

-some examples, including some developed to aid online information retrieval.

4.9.2 Outline

Introduction to expert systems, definitions, components (knowledge base, inference engine), their possibilities and limitations. Rule based systems, semantic nets, shells. Some examples from outside this subject area e.g. Mycin. Differences between an expert system and an information retrieval system. Intelligent front ends (including the extent to which they are intelligent), intelligent gateways - advantages and disadvantages (use Hawkins and Levy, 1985), expert systems in information retrieval, Examples PLEXUS, CanSearch, Easynet.

4.9.3 Teaching methods

Lectures, discussion, practical work, visit.

4.9.4 Practical work

Small demonstration expert systems for an IBM PC or compatible machine can be used in practical classes. Animal and Doctor on Esie are examples. If access to authoring software or a suitable programming language is available other practical work is possible.

4.9.5 Time required

Non-practical work: 4 hours

Practical work: 1 hour with demonstration expert system or more if Prolog or a shell is to be used to construct a simple system.

4.10 Inhouse database design, construction and use

This is an important topic for all the types of participant considered. It is of key importance for all library and information professionals who may have to carry out such tasks. It is of central importance to other professionals attending continuing education programmes if they are involved in database construction and even the end

users may find it helpful to know something about constructing personal bibliographic databases on computer.

Note:
1. This topic may be considered so important that one or more separate programmes are designed. However, even if this is done, it is necessary to include something on database design in online information retrieval programmes because:-
   a. Design affects retrieval
   b. Participants may only be able to attend one course but be involved in both design of, and retrieval from online services.

2. The use of office automation facilities in database production should be studied in this course.

4.10.1 Objectives

1. To identify the main criteria it is necessary to consider in inhouse database construction and use.
2. To study examples of inhouse database design, construction and use as described in the literature and through practical experience.

After these sessions students should know:-
- -the stages in the design process
- -a systems approach to database design
- -the range of outputs which can be produced from a database
- -some examples of software for this purpose and their advantages and disadvantages

4.10.2 Outline

Design of databases:- the design process, design questions, design tasks, design decisions, systems approach, user study/market survey, user needs and criteria, outputs (printed indexes, online database, SDI and standard profiles, current awareness and other publications, catalogues, directories and referral tools -online, CD-ROM or printed-, databanks). Inputs, choice of hardware and software (including CDS/ISIS from UNESCO), choice of record format, system. Costs. Evaluation and feedback. Case studies of appropriate systems to examine strengths and weaknesses e.g ILCA (International Livestock Centre for Africa), PADIS, UN (Habitat), ICIPE, AGRIS. Use of downloaded data in creating a database. Uploading data. Co-operation and problems of standardisation or compatibility.

The problems of database production in languages other than English and scripts other than roman.

4.10.3 Teaching methods

Lectures, discussion, seminars, case studies, practical work, visits.

4.10.4 Practical work

If suitable facilities are available it should be possible for each participant to search an inhouse database and to input some records to an existing database. More time is needed if students design and build their own databases but this is a good team exercise.

4.10.5 Time required

Non-practical work: 10 hours. Practical work: searching and input 2 hours (possibly the same work as for 4.3; design and implementation about 10 hours per student).

4.11 The marketing and promotion of databases and services

This course can form part of a wider marketing and promotion course covering all aspects of library and information service or form a separate course as outlined here.

The topic is covered from the point of view of both the marketing or promoting one's own service and of being the recipient of marketing or promotional approaches. Marketing and promotion of services are important even if the service is a free one to the organisation's own staff. An important aspect of purchasing services or especially, equipment or software, is the drawing up of a specification or call for tender.

These subject areas are likely to be of most interest to LIS and other professionals who are concerned with marketing a service of some kind but, because of the inclusion of the reverse situation, it is likely to be of interest to those, including end users, with no service to offer but who do have to make decisions on purchases.

Note:

In designing a database a market survey is needed so there is some overlap between 4.10 and this course.

4.11.1 Objectives

After these sessions students should:-

-understand the main aspects of promoting the use of a database or service within an organisation

-understand the main aspects of marketing a service

-have a sound understanding of the different approaches which may be made by others to sell him or her a product or service and be able to make decisions without being unduly influenced by these approaches

-understand how to produce a specification or call for tender notice for a service or equipment the organisation wishes to purchase, and how to deal with the potential suppliers.

4.11.2 Content

Marketing

Identifying potential users and markets, what a user profile is and how to produce one, market surveys and other approaches to establishing the market for a product, this should include the identification and use of appropriate published sources of information (including online sources), ways in which a product may be distributed (for example, in paper form, online, floppy disc and the advantages and disadvantages of each from the point of view of the producer). Selling, leasing and other financial arrangements for distribution from the point of view of the producer. Market promotion, advertising, exhibitions, mail shots and so on, pricing and revenue, legal aspects (copyright, data protection, contracts, legal complications if dealing with organisations in other countries, product liability).

Purchasing

How to cope with sales staff, how to read sales literature, how to reach purchase decisions, preparation of specifications and call for tender notices for expensive purchases. Looking at contracts. Purchasing and leasing - pros and cons.

4.11.3 Teaching methods

Lectures, case studies, discussion, role playing and team exercises

4.11.4 Practical work

A team exercise in planning the marketing of a product is useful as is a role playing exercise in selling and purchasing.

4.11.5 Time required

Non-practical work: 12 hours. Practical work: The team exercise can be assessed work and can take each student more that 12 hours, but this depends on the extent of the work required. The role playing exercise can take 3 hours per student.

4.12 Online cataloguing services and online public access catalogues

These subject areas are mainly of importance to LIS students and professionals. End users are only likely to need to know about these services if there is a chance of them having access to them.

4.12.1 Objectives

1. To describe some of the online cataloguing services which exist especially any used within the country.
2. To consider the functions of such services as sources of bibliographical information and as catalogue record services. (Examples, OCLC, WLN, Library of Congress, British Library, BLCMP).
3. To describe some OPACs and to consider their impact.

4. To examine some of the techniques used in some OPACs to increase user friendliness for the naive user, and to relate these to other online services.

After these sessions students should:-
-know of some examples of online cataloguing services and OPACs

-understand their implications for cataloguing and the provision of bibliographic information to library users

4.12.2 Outline

Online cataloguing services:-definitions, examples, uses, co-operative schemes. Include any local or national examples.

OPACs:-definitions, examples (include any local or national examples), uses (including subject searching), techniques to aid naive users. Implications for other online IR. OKAPI is a good example to use since it employs several of the newer retrieval techniques.

4.12.3 Teaching methods

Lectures, discussion, seminars, case studies, practical work, visits.

4.12.4 Practical work

If possible, hands-on practical work or a demonstration. A simulation of a cataloguing service would be useful if online access is not possible, but no current one is known to exist.

4.12.5 Time required

Non-practical work: 6 hours. Practical work: 2 hours.

4.13 Managing an online information service

This section covers both running an online service based on searching remote databases and running a service based on inhouse databases. It is important for all LIS students and professionals who may already have this duty or who may have it in the future.

Note:

If some students do not take the marketing course (4.11) then some of that course should be included in this course.

4.13.1 Objectives

To study the management aspects of setting up and running an online information service.

After these sessions students should know:-
-the main management aspects of running an online service

4.13.2 Outline

Setting up a service:- Scheduling its introduction. Staff, materials, machines, costs and charges. Identifying

the potential users. Legal/intellectual property (including copyright) aspects. Management of change.

Running a service:- staff, materials, machines, costs and charges. Impact on other services (for example inter-library loan).

Online in academic and public libraries and industrial, commercial and other information services (if considered appropriate). Examples from the country or region (especially any which are visited during the course).

4.13.3 Teaching methods

Lectures, case studies, seminars, discussions, role playing, visits

4.13.4 Practical work

Role playing and similar exercises. Visits of observation followed by discussion are of prime importance for this subject.

4.13.5 Time required

Non-practical work: 6 hours (plus discussion on any visits). Practical work: 3 hours per student per exercise.

4.14 Policy aspects and economics of online

Teachers should consider especially national and regional matters relating to the course participants. There may be overlap with the course on management of online information retrieval services (4.13) although it is possible to distinguish between the day to day management of a service and longer term forward planning within a policy framework.

Although all types of course participant can benefit from teaching in this area, it is not so important for end users or librarianship or information studies (LIS) students taking the lowest level courses. Participants on continuing education programmes are likely to be the most concerned with these issues.

4.14.1 Objectives

To study critically existing information policies at various levels within and outside the country and to identify other possible policies.

After these sessions students should:-

-have some understanding of the online environment on a worldwide basis

-know what constitutes information policy

-have discussed some appropriate examples of information policies

-to know something of the economics of the online industry and the implications for its customers

4.14.2 Outline

World in which the policies must be planned:- technological, economic, social, legal and political aspects. Examples of economic and political aspects:-slowing down of the growth of the US market, continued growth in European market (effect on US hosts); government investment in electronic information handling (US and Federal Republic of Germany); implications for private producers and possibilities of government limitations on transborder transfer; increasing aggregation of hosts (monopolies?); lack of profitability of online services; new services appearing only in electronic form, swing in returns to database producers from hard copy to online version. Implications of CD-ROM and other newer technologies.

Appropriate examples of national information policies, regional activities and policies. International activities. UNESCO PGI, etc. Implications and alternatives. What do these mean at a local and inhouse level?

4.14.3 Teaching methods

Lectures, seminars, discussion, case studies, visiting speakers and visits.

4.14.4 Practical work

None but active participation in discussion is needed.

4.14.5 Time required

Non-practical work: 6 hours.

4.15 International issues and local problems

There is likely to be considerable overlap between this course and 4.14 Policy aspects and the economics of online but it is the intention in this course to relate the international and regional policy aspects to the situation in a particular country and even to the circumstances of particular organisations within that country.

This course is likely to be of interest to participants on all types of programmes, although those on the lowest level library technician type programmes may need only a brief indication of this subject. End users would benefit (if sufficient time is available) although it is not the most important aspect for them. This topic is likely to be of especial importance to practitioners attending continuing education programmes.

4.15.1 Objectives

After these sessions students should understand:-

-the national situation in relation to online information retrieval

-the international and regional situation and its effect on his or her country and region

4.15.2 Content

The online industry. Technological, economic, social, legal, educational and political aspects of the international situation and the local situation (national, regional and organisational) and their interrelationships. Short term and long term goals.

4.15.3 Teaching methods

Lectures, discussions, case studies, visiting speakers, visits.

4.15.4 Practical work

None except visits.

4.15.5 Time required

8 hours.

4.16 User education

Any course on user education, should include consideration of users in relation to online searching. A course on user education is likely to be an elective course, which is one reason for including end user searching in Section 4.4.

4.16.1 Objectives

After these sessions students should:-

-know the present state of the art in user education both locally, regionally and internationally, especially in relation to online information retrieval

-know the present state of the art in end user searching both locally and internationally

-know some of the techniques for teaching end users

-be capable of teaching end users to search using online services of a variety of types.

4.16.2 Content

Objectives of user education, types of user and their different educational needs in relation to information handling. Case studies in user education. End user online searching - state of the art, methods of education and training.

Designing teaching programmes (courses and AV and computer assisted learning packages) for particular user groups. Practical planning of courses. Practical preparation of teaching packages. Teaching methods including the use of existing software and other packages. Evaluation methods.

Much of the practical information in these Guidelines is relevant.

It is important to place online searching in the wider context of searching for information so that users understand when it is appropriate to use this method. It is recommended that students are taught that users should be taught only in

groups which have some common subject interest for example, postgraduate chemists should be taught separately from postgraduate geologists, since the subject has such a strong influence on what should be taught.

Note:
Computer assisted learning is often called computer assisted instruction. The abbreviations CAL and CAI are often used.

4.16.3 Teaching methods
Lectures, case studies, role playing, practical work, observation,

4.16.4 Practical work
Design and implementation of courses or packages -if time is available.

4.16.5 Time required
Non-practical work: 14 hours. Practical work: this could be very time-consuming and perhaps more suited to a dissertation or major project rather than being normal assessed work. However, teams of students could perhaps produce something useful in a shorter time. 12 hours.

4.17 Online information services as sources of information
This section covers the online IR teaching which should form part of any information resources or bibliography course. The extent to which online sources are included depends on their availability in the country. For example, any business information course in the UK would be largely devoted to online bibliographic and non-bibliographic sources but this would not be the case in some other countries. Some areas are particularly important for development such as agriculture, medicine, science, technology, education, commerce and economics. Some programmes may include a general bibliography course, others may have, perhaps in addition, and as electives, separate courses for one or more of the areas mentioned. It is not possible to go through all these subjects but several examples are given.

All participants, including end users especially, need to know the range of facilities which exist in appropriate areas but the extent of the teaching depends on what online services are available within a country and what the participants know already.

4.17.1 Objectives
1. To provide a critical and evaluative overview of the major online sources in the subject.
2. To teach how to search for information in this subject using online sources.
3. To study the design of selected online information services in the subject.

4. To place the online services in the context of other sources of information available for that particular subject.

After these sessions students should know:-

-of relevant online services (of various types) in a particular subject and how to use them

-their availability in the country

-other sources so they can be placed in context

4.17.2 Outlines

Sources of information in science and technology

Communication and information flow in science and technology. Characteristics of the information related behaviour of scientists and technologists. Patterns of dissemination of the results of research in these fields.

Types of communication:-oral, unpublished, published, primary, secondary, tertiary. Bibliographical control (in its widest sense). Bibliographical control of periodicals (both whole periodicals and the papers they contain), importance of periodicals.

Evaluation of sources of information

Abstracting and indexing services, current awareness, citation indexes, online secondary services (subject based):- importance, coverage, how to search them, evaluation. Remember that tools covering a broader area may be important (for example Biological Abstracts or Scisearch for Zoology).

Full-text services, data and databanks, videotex.

Importance of particular types of publication and the tools manual and computerised, which control them:-

-grey literature (official publications, reports, theses, conference proceedings).

-standards and patents (trade marks and registered designs)

-trade literature and commercial information

The language barrier (as appropriate in the country concerned). Searching for information and presenting it.

Sources of business information

1. In many countries, most commercial organisations do most of their searching for information using online services, especially databanks.
2. Business or commercial information is of major importance in many different types of organisation and it can be of prime importance for development.
3. In this course outline it is assumed that there is access to some of the commercial databanks (some of which are particularly expensive to use) and good access to databases and databanks available on the normal online hosts such as Dialog.

Note: any national or regional sources or subject areas of particular importance should be covered.

Sources of information for agriculture and agroindustry

Subjects underlying agriculture and agroindustries (biology, biochemistry, biotechnology, medicine-veterinary and occupational, chemistry, toxicology, earth sciences, engineering, food science. Chemical and biological nomenclature in searching.

Agriculture and agroindustry nationally and regionally

Types of people involved in agriculture and agroindustries and the communication of information nationally and regionally. Problems of communication of, for example, the results of research to farmers.

Information sources, systems and services (online and manual):-

Supranational/international organisations and the information services they provide (Food and Agriculture Organisation, International Potato Centre, International Livestock Centre for Africa, etc.).

National organisation and the information services they provide

Secondary services (Biological Abstracts, Chemical Abstracts, abstract journals from the Commonwealth Agricultural Bureaux International, Bibliography of Agriculture, Agrindex, and their online equivalents.

Data services (Predicasts etc.)

Grey literature (especially official publications and reports)

Patents

Standards

Trade literature, marketing and commercial information

Searching for information and presenting it.

Evaluation of sources of information

Sources of chemical information

Chemical nomenclature and structures in searching.

Range of subjects areas included, their importance and significance of particular features. (For example, in toxicology the different ways that toxicity is expressed

Chemical structures and reactions - searching for information. Services such as CAS Online, DARC, Software such as Psidom.

Data collections -mass spectra, crystallographic.

Communication in the broad field (research, practice, production workers)

Types of communication:-oral, unpublished, published (primary, secondary, tertiary) and the ways they can be traced -relevant examples)

Chemical Abstracts Service, publications and services, manual and computerised

Other secondary services manual and computerised (including Science Citation Index and Biological Abstracts)

Beilstein and Gmelin which are to be available online. Beilstein shortly. Gmelin in some years.
Patents and chemistry
Official publications (including relevant legislation)
Trade and commercial information
Health and safety information.

4.17.3 Teaching methods

Lectures, discussion, practical work, visiting speakers, visits.

4.17.4 Practical work

Online searching for information using available sources including databanks, where possible. Manual searching to establish the value of the different sources. Use of a simulation with searches in the subject or an emulation with a database in the subject. Projects such as a market survey or service design which would involve using many of the services (team or individual work). Visits of observation to organisations with an information function.

4.17.5 Time required

This will vary considerably with the course, previous experience of the students and the resources available but as an indication:-Non-practical work: 30 hours. Practical work: 6 hours.

5. SAMPLE TEACHING PROGRAMMES

The sample teaching programmes outlined below are not intended for use as they are presented here, since many specific factors have to be taken into account in designing a teaching programme, including those listed in 6.1. However, these examples are useful as illustrations of the range of courses which can be devised using the topics outlined in section 5, and also serve as frames on which to base the design of specific programmes, although it is not claimed that any of them is ideal. Most are based on real courses but none is a direct copy of an existing course.

5.1 User education

5.1.1 A one week course in information retrieval for higher degree by research students at a university with online access to relevant databases

Objectives of the online part of the course
After the course the student should know:-

- -what online searching is
- -what facilities for online searching are available in the library or information service
- -what facilities are available in the country or region
- -when to ask for an online search and when to use manual sources
- -how to do simple searches on a few databases relevant to his or her research using one host

Content

Most of the course is devoted to teaching about searching for information using manual sources but 2 days are devoted to the following:-

- -a basic introduction to online searching (based on 4.1), duration 1 to 2 hours
- -a short demonstration of online searching (1 hour)
- -use of a computer simulation of online searching in the broad subject area in which the student is studying and using appropriate databases and hosts (2 hours)
- -an account of databanks and their availability if there are some in the subject area (based on 4.5 (2 hours)), illustrated by suitable examples.

-guided search preparation and carrying out an online search on the research topic. (This may be too expensive especially if there are many research students to be taught).

-availability of online searching in the institution and elsewhere in the country and the terms on which they can gain access.

Note: It is considered essential that courses should be related to the students' subjects. Therefore only students from one Department should be taught together.

The relative merits of the online and manual sources in the subject should be stressed, together with the reasons for choosing one searching method rather than the other in particular circumstances.

Resources

1. Manual and online sources of information for the subject.

2. Teaching room(s) in the library.

3. A simulation on a mini or mainframe computer with multiple terminal access or networked or with sufficient microcomputers and copies of the package to be used by several students at one time.

4. Teachers who know sufficient about the subject and its sources of information to be able to teach.

5. Online access, if possible with facilities so that several students can see the search (see Section 6.3.3). If only one online terminal is available it makes live individual searching time-consuming.

6. Sufficient searching aids. Multiple copies of some, especially the brief guides, may be needed.

5.1.2 One and a half day training course in online searching for end users

Objective

The participant should be capable of carrying out simple searches on a limited range of databases (not more than 4) using one command language.

Content

Introductory talk on online searching (based on 4.1), but emphasising the facilities and subject range of the host and databases available to the end users (2.0 hours).

Demonstration of online searching (1.0 hour).

Use of a suitable simulation of online searching showing searching of the hosts and databases which will be available to the participants after the course (2 hours).

Instruction in search construction and searching with the main commands of the service to be used. This should revise and emphasise what is shown in the simulation (1.0 hour).

Documentation and help (including in-house help) available (1.0 hour).

Preparation and running of searches by participants with the teacher present (2.0 hours per student)

Note:
Participants should be reminded of when to use manual and when to use online sources. Online searching should be placed in context.

Resources
1. Online access with sufficient terminals for the participants to be able to search easily both during and after the course.

2. Suitable teaching rooms.

3. Online facilities with means of enabling groups of participants to see the screen (see Section 6.3.3).

4. An appropriate simulation on a mini or mainframe computer with multi-terminal access, networked microcomputers or in multiple copies which can be used on several micro-computers at once.

5. Sufficient copies of the search aids.

6. Experienced teachers.

5.1.3 A short travelling introductory course for administrators or managers

This course is aimed at top management, accountants and others who are unlikely to be willing to go to a library or information centre but who are in need of information available online and who are influential and so important to educate. It is intended to do the course on an individual basis in the person's office.

Objective
To create an awareness of online and what it has to offer.

Content

An introduction to online slanted carefully to the audience and an appropriate demonstration of online searching (1.5 hours).

Note: it is essential to use appropriate illustrative material. Financial databanks may be important and if so, any available should be included in the demonstration.

Resources

1. Online access.
2. A portable terminal and acoustic coupler (or equivalent).

5.2 Continuing professional education

5.2.1 A 2-3 week course for professional LIS staff and possibly any other senior professional staff who are involved with computerised databases, in a country where online services are available but not widespread or where they are soon to be introduced

The duration partly depends on the range of practical work available and on the number of institutions to be visited.

Objectives

After the course the participants should:-

-have up to date knowledge of online information retrieval from bibliographic and full-text databases, databanks and videotex.

-know the basics of inhouse database construction and use

-have an understanding of management aspects of online information retrieval

-know something of online cataloguing services and OPACs

-know the present state of online information retrieval in his or her own country and elsewhere.

-understand the national and international implications of electronic publishing and information technology for information provision

-have gained some practical skills (depending on the practical work which is done)

Content

The order given below is a sensible one but it is likely to need modification for practical reasons. If possible the visits should be spread throughout the course. Time should

be allowed for discussion of visits and for (especially) the national implications.

Note: One day=6 hours.

-Basic online lecture (2 hours) plus practical work as available (total 6 hours)(4.1)

-Computer and telecommunications basics (6 hours)(4.2)

-Information retrieval basics (6 hours including practical work) (4.3)

-Searching using online services (4 hours including any practical work) (4.4)

-Databanks, full text, videotex (3 hours) (4.5, 4.6, 4.7)

-Other electronic publishing (2 hours) (4.8)

-Artificial intelligence in online searching (2 hours) (4.9)

-Inhouse database design, construction, use and marketing (6 hours plus 3 hours practical) (4.10 and 4.11)

-Online cataloguing services and online public access catalogues (2 hours) (4.12)

-Managing an online information service (6 hours)(4.13)

-Policy implications inhouse, local, national, regional and international (6 hours)(4.14 and 4.15)

-User education (4 hours) (4.16)

Review session and evaluation (3 hours)

Visits

Resources

1. Access to online services of various types.

2. Access to computer simulations of online services

3. Computer facilities to run the simulations

4. Suitable organisations to visit

5. Suitable teaching rooms

6. A minimum of three teachers (or the use of invited speakers for some topics).

Note:
This course can be run with few resources, if it is possible to exploit the resources of outside organisations.

5.2.2 A three day online sensitisation course for library and information work professionals in a country where online information retrieval is available but not widely so

Objectives
After the course the participants should:-
-have a better understanding of online information retrieval and the technology associated with it

-be able to construct and run simple searches online

-know what facilities are available in the country (including inhouse database installations)

Content
Day 1 (1 day=6 hours)
Introductory session (based on 4.1 but modified to take account of the participants' knowledge of online) It should include an overview of the local situation. (1 hour).

Computer and telecommunications basics (based on 4.2 but modified to take account of the participants' knowledge and including information relating to the particular country) (1.5 hours)

Online information retrieval (based on 4.3, 4.4) modified to take into account the participants' knowledge and the local situation). This has to be severely cut so great care must be taken to select the most appropriate aspects. (1.5 hours)

Practical work. Demonstration of online searching, use of a suitable simulation (2 hours per student)

Day 2
Databanks, full-text and videotex. (based on 4.5, 4.6 and 4.7) (modified to fit the local circumstances and the time available). Databanks are likely to be the most important. (2.0 hours, including any demonstration). A session on online cataloguing services and OPACs (based on 4.11) may be included instead depending on the interests of the participants and the local circumstances. In a three day course there is not enough time to cover both topics.

Other electronic publishing (based on 4.8) (1.0 hour)

Managing an online information service (based on 4.13) (1 hour).

Practical work. Preparing and running searches (possibly on databanks as well as bibliographic services) (1.5 hours per student). Although it may be possible to have ten or even twenty students preparing searches at once (provided sufficient sets of documentation are available), each student will need some individual hands-on time to run the search (minimum 15 minutes) so timetabling within a three day course is likely to be difficult. It may be possible for students to prepare their searches in their own time (unsupervised) so that they can start the actual searching straight away, to do the searching itself outside normal teaching hours and to work in small groups. Assuming one online terminal and 15 minutes per student, twelve students can search in 3 hours.

Day 3

Half day visit to an information service with appropriate facilities.

Policy implications (possibly a discussion session) (based on 5.13 and 5.14) (1.5 hours)

Final review including a discussion of the visit, evaluation of the course, and further discussion of any major points arising from the previous sessions.

Resources

1. Online facilities

2. Computer facilities for the simulation

3. Teaching rooms

4. At least two teachers to share the teaching

5. A suitable information service to visit

Note: It is likely that courses such as these, will stimulate demand for more advanced or specialised continuing education programmes.

5.3 Basic professional education

5.3.1 A one year (12 month) Masters programme

Some of those obtaining Masters degrees in librarianship or information studies are likely to be the leaders in the professions in future. Therefore they need to know most about this important field. However, the extent to which it is covered still depends on the availabilty of information technology in the country and the types of employment that graduates can expect. An MSc programme was chosen as one which should place great emphasis on online information retrieval.

MSc in Information Studies

A one calendar year programme, including four months for the dissertation in a country with easy (but not cheap) access to online services. Students all have at least a first degree in a scientific or technological subject. It is not

possible to indicate the time spent on each specific item but each term is ten weeks long, and each course is allowed two contact hours per week plus practical work (with Computers and Telecommunications having rather more). In addition the students are required to do extensive reading and other private study.

Objectives of the MSc Programme
The students should:-

-gain a broad professional education over the wide field of information studies (including online information retrieval) to enable them flexibility in career choice.

-develop a critical, evaluative approach to information problems and the ability to deal with change in a rapidly developing field.

Content
Term 1 Five required courses:-
1. Computers and telecommunications (which includes the topics listed under 4.2 Computer and telecommunication basics)

2. Information resources (which includes topics listed under 4.1 Introduction to online searching, 4.5 Databanks, 4.6 Full-text, 4.7 Videotex and 4.17 Online information services as sources of information. Online practical work includes a literature search for a real enquirer)

3. Information storage and retrieval (which includes topics listed under 4.3 Information retrieval basics relating to online information retrieval and some of 4.12 Online cataloguing services and online public access catalogues).

4. Systems and management (some design and management aspects included here)

5. Communication

Term 2 Two required courses and three elective courses
1. Computers and telecommunications (see above)

2. Computer based information retrieval (covering 4.4 Searching using online services, 4.8 Other electronic publishing, 4.9 Artificial intelligence in online searching, 4.10 Inhouse database design, construction and use (although there is some overlap with the Computers and telecommunications course and the Information Storage and Retrieval elective)), 4.13 Managing an online information service, 5.14 and 5.15 Policy implications).

Elective courses chosen from:-
Advanced programming

Chemical structure information systems (computerised)

Information sources -in a range of subject areas (includes aspects of 4.15 Online services as sources of information)

Advanced text processing (includes novel retrieval techniques)

Information storage and retrieval system design, construction and evaluation (includes 5.10 inhouse database design, construction and use)

Developing countries: library and information systems (includes 4.14 and 4.15 Policy implications)

Technology transfer (includes aspects of 4.14 and 4.15 Policy implications)

Knowledge processing (includes expert systems in general)

and other elective courses

Term 3 (4 months)
The dissertation

Many of the topics chosen are related to online information retrieval. The ideas come from the students, the staff and those in outside organisations.

5.3.2 Undergraduate programmes

These usually last three or more years. Leaders in the professions may come from amongst the students. However, most students do not have the advantage of having studied another subject to degree level. The extent to which online information retrieval is covered depends on its availability in the country and the type of employment that the graduates can expect.

All students, regardless of these factors should have at least an introduction to most of the topics mentioned in Section 5, although some of the more specialised could be dealt with in greater depth in elective courses or omitted altogether, if the facilities are not available.

A five year (ten semester) undergraduate programme in a university leading to a professional qualification (licenciatura)

Objectives

Students should gain a sound, professional education in library and information studies to enable them to obtain employment in a variety of libraries and information units.

The teaching programme should have sufficient academic content to enable some students to seek further academic and professional qualifications later.

Note:
Students have four semesters (2 years) of studies of other subjects before starting the librarianship and information studies courses. After a further 2 semesters (1 year) a Bachiller qualification may be awarded and 4 semesters after that, the Licenciatura.

Content
Introduction (12 hours) (includes 3 hours on present trends in information and communications technology and its impact on library and information work).

Information and society (40 hours):- communication, history of recorded knowledge, information and national development, issues on illiteracy and reading, user studies. (this raises some policy aspects in a general way).

Information sources and services (80 hours):- general introduction and ALL the following courses:-
-information sources in science and technology,
-social sciences
-humanities
(these include online sources including databanks and should be the basic introduction to online searching)); libraries and information centres; archives; community information services; dissemination of information (including the reference interview, searching, SDI and document delivery including some online aspects); information analysis and presentation (including abstracting and the preparation of indexes including some online aspects); promotion and education for library and information use (including the promotion of online services and end user education).

Organisation and retrieval of information (120 hours):-bibliographic control; systems of knowledge; organisation and retrieval of information (including evaluation of retrieval systems and some online aspects of cataloguing and retrieval).

Management of libraries and information services (40 hours) (including managing an online service).

Information technology and systems design (120 hours) computer basics, programming, computer applications in libraries and information services (including online information retrieval); other forms of electronic publishing; artificial intelligence; policy implications of IT; analysis, design and evaluation of information systems (including inhouse database construction).

Research methodology (20 hours)

Dissertation

Professional Practice (that is supervised work in an approved information service or library)

5.3.3 Nongraduate programmes

These are of variable length and level, including "professional" and "non-professional" (that is library technician) levels but leaders of the professions are unlikely to come from these courses unless they undertake higher level education later.

Objectives

The students should gain a sound, basic librarianship or information studies education at either professional or technician level depending on the programme.

They should have basic practical skills to enable them to perform routine tasks efficiently and with the minimum of supervision.

Content

All students should know something of online information retrieval (perhaps by the basic lecture, 5.1) and of computer and telecommunications and information retrieval basics. It may be appropriate to include practical aspects of, for example, data input, if that is the sort of task students are likely to do on completion of the course. Other topics could be included as elective courses but the majority are likely to be too advanced or specialised for this population.

6. FACILITIES FOR TEACHING ONLINE INFORMATION RETRIEVAL

6.1 Library facilities

It is essential that organisations teaching online information retrieval should have good libraries containing relevant materials. Both teaching staff and course participants should be able to (and be expected to) practice in their own subject the information seeking behaviour that they advocate to others. Thus, there should be resources to enable staff to keep up to date with their subjects, whilst students (especially on higher level courses) should be required to search for and read much more than just items on reading lists, although these are important. One way of encouraging students to read more widely is to set coursework for which such reading is necessary and to mark the work accordingly.

6.1.1 Interlibrary loan

The library itself should have a good stock of materials for staff and student use. Inter-library loan or photocopy service support, although useful, is expensive, loan periods are unsuitable and it may take too long to obtain items. It may be possible to obtain photocopies of items in advance of teaching the topic, and then to copy them for student use, but specific clearance is usually required from the copyright holders before this can be done legally.

6.1.2 Periodicals

Since online information retrieval is changing rapidly, especially in essential detail, periodical articles are much more useful than textbooks, even for student use. Appendix I lists English language periodicals of potential use in this broad subject area. Many of the periodicals listed are general information studies journals which should be in any collection in this field. Some, however, are limited to narrower areas, whilst others are newletters rather than refereed journals. More general scientific journals such as Science, Scientific American and Recherche sometimes have useful articles.

Because online information retrieval is such a rapidly changing subject area long back sets of periodicals are unnecessary although for the major general librarianship and information studies periodicals back sets should be longer.

6.1.3 Review journal

The Annual Review of Information Science and Technology is the most useful review journal in the field. Each issue is likely to contain several relevant reviews as the indicative reading lists (Appendix II) demonstrate.

6.1.4 Online proceedings

Many of the indicative readings come from the International Online Information Meeting proceedings which, although expensive and containing papers of variable quality,

provide up to date accounts of practical topics some of which are rarely written about in journals. The papers are usually written at a suitable level for students. The National Online Information Meeting proceedings also contain useful papers, although there is a strong United States bias in the contents.

6.1.5 Secondary services

For keeping up to date and, more especially, for information on specific topics, secondary services are needed. These can be used online if the facilities are easily and cheaply available since the major databases covering this area LISA, Information Science Abstracts, ERIC and INSPEC are available online.

ERIC and LISA are already available on compact disc. Some libraries have purchased these databases in this form thus providing online access in-house at low connect cost. However, this sort of searching usually has to be done manually. Whether online searching is available or not, some of the major manual secondary services Library and Information Science Abstracts, Information Science Abstracts, Research in Education, Current Index of Journals in Education, Computer and Control Abstracts, Pascal Thema T205 Sciences de l'Information. Documentation and Referativnyi Zhurnal Informatika should be available for regular staff and student use although the journals selected will depend in part on the languages understood by staff and students.

Subject secondary publications and their online equivalents, for example, Chemical Abstracts, Biological Abstracts and Index Medicus contain references to papers on information handling in their subjects.

6.1.6 Grey literature

Grey literature is an important source in this area and some examples of this form are listed in the indicative readings. A special effort may be needed to acquire suitable material. UNESCO General Information Programme publications are examples.

6.1.7 Use of other libraries

If, as is quite likely, the main library to be used by staff and students, is not completely adequate, the resources of other libraries near by should be checked to see if they can be used to supplement it. Access arrangements should then be made. British Council and other similar libraries should be considered as possible sources.

6.2 Bench collections of documentation:-manuals, workbooks, thesauri and newsletters

Ideally, these tools should be kept in the laboratory in which the online teaching facilities are housed, since it should be possible to refer to them before or even during online sessions.

Although much of what follows relates especially to online host services and online databases, documentation is also needed for equipment and software of various kinds.

6.2.1 Manuals

Manuals may deal with equipment, software, host services or databases. They may be simple, brief and non-technical or the reverse. Sometimes manuals written at different levels, are available for the same product. Many manuals are distributed by the producer of the software, database or service. They may be included in the basic cost of the service, purchased separately, and/or available on standing order. Some (especially for commercial software packages or programming languages) are published and distributed through the book trade in the normal way.

6.2.2 Workbooks

Workbooks, such as the Dialog Workbook, contain graded exercises which teach the use of a particular service. They may be useful sources of student exercises but some care has to be taken since the exercises may be prove to be expensive to use, especially with large classes.

6.2.3 Thesauri

Thesauri may relate to a particular database or group of databases or may be even wider in coverage. Examples include the ERIC Thesaurus, MeSH (Medical Subject Headings) and the Index of Psychological Terms. They should be consulted during search construction even if natural language terms are to be used, since their use may help in the identification of synonyms. Some database guides, such as the BIOSIS Search Guide include lists of preferred terms. The use of such tools is especially important for students preparing searches in English whose first language is not English.

6.2.4 Newsletters

Newsletters are usually issued by hosts, database producers and sometimes hardware and software manufacturers, to keep their users up to date with their products. The cost is often included in the basic cost of the service. It is important to read these newsletters as they appear.

6.2.5 Budget

It is essential to set aside money to purchase aids for the services used. A start up budget of about US $500 with a similar amount annually is suggested, if one or two online hosts are to be accessed and twenty or so databases searched regularly.

6.2.6 Selection

Priced items, except those available through the book trade, may be selected from other tools relating to the service or database. For example, thesauri and other searching aids for each database are listed in the Dialog Guide to Databases.

6.2.7 Shelving and filing

Suitable shelving and/or filing facilities should be provided. The actual work of shelving and filing loose-leaf inserts is time-consuming (about one hour a week typically, is needed to file the material originating from six online hosts and their associated major database producers) and assistance with this may be required. Simply keeping heavily used manuals in good repair can be very time-consuming.

6.2.8 Security

Care must be taken to ensure that documentation is not stolen or, if unique, even borrowed. Loss may make it difficult or even impossible to use a particular service. Replacement may be slow, expensive or impossible.

6.3 Teaching facilities

There should be rooms for formal lectures, seminars and small group work. There should also be one or more 'laboratories' in which any computer equipment which is available should be located. Although it is sometimes possible to use a room for more than one purpose, this usually entails the frequent moving of furniture and equipment.

Equipment is expensive and its unauthorised use can also be expensive, therefore adequate security is essential. It may be necessary to lock telephones and rooms and to bolt equipment to benches. Some organisations also have central security services which may be used. Although security is essential it does sometimes create a barrier to legitimate use.

6.3.1 Lecture and seminar rooms

Lecture and seminar rooms for teaching online information retrieval do not require different facilities from those needed in rooms used in teaching other subjects.

Audiovisual equipment such as overhead and 35mm slide projectors, video and audio cassette players, and TV monitors can be required. An overhead projector which can project the image from a microcomputer screen can be very useful.

Rooms should have ample, safe and conveniently placed power points. These should be of the correct voltage for the equipment to be used. If the electricity supply suffers from voltage fluctuations and the power supply of the site or building as a whole is not protected from the effects of this, then each individual piece of audio-visual equipment should be protected. This will avoid the frequent blowing of fuses and risk of damage to the equipment.

There should be blinds or curtains so that teaching rooms can be darkened properly when visual aids are used.

6.3.2 Laboratories

The different types of equipment will be considered in Section 6.4, here the general facilities of teaching laboratories will be considered. When planning laboratory facilities, the advice of computer experts who know local

conditions is needed. However, the book Microcomputers and their applications in developing countries (1986) has some useful general advice.

It is even more important to protect computer equipment against voltage fluctuations than audio-visual equipment, since even a transitory power failure can destroy information in the computer's random access memory. Some protection can be achieved by using a commercial surge protector but more can be gained by using the Uninterurruptible Power Supply (UPS) although this is expensive. If power blackouts are common, it may be necessary to have a back-up power supply, especially for larger computers (main-frame and mini-computers) although the emergency generator may have to be imported.

Some computer models being sold in some developing countries now have some built in protection and this is a feature for which it is worth checking. However, this is not always sufficient to cope with a total power failure. At the present time portable microcomputers which can run on batteries as well as mains power, are unlikely to be suitable for teaching purposes.

Air-conditioning will be required for main-frame or mini-computers but it may also be necessary for micro-computers in hot climates. Alternatively, it may be necessary to fit a fan to each micro-computer to cool it (though this is less effective than air-conditioning) and to find other means of protecting equipment (not just micros) from dust or humidity.

Ample power points are needed; four per work station would be adequate. Placing power points above table height can prevent dangerous tangles of cables on the floor. Using plastic trunking for cables (that is, not putting cables in the walls) makes it easier to add new cables.

Visual display unit screens should be placed to avoid reflections and glare. If necessary anti-glare screens should be fitted.

Other ergonomic aspects need to be considered, for example adjustable typists' chairs are more suitable than ordinary chairs for those working at VDUs (Morris, Dyer and Dowling, 1987).

Health and safety guidelines and papers should be consulted (Cross and Bawden, 1987; Health and Safety Executive, 1983: MacMorrow, 1987(a)(b)).

There should be sufficient working space around each piece of equipment.

When choosing equipment it is sensible to consider likely future developments in both teaching and equipment. However, in many instances all that can be hoped for is to obtain equipment which will fulfil the current need even if it is known that both the requirements and the range of equipment available will change in the near future.

Maintenance charges on equipment are high, 10% to 15% of the purchase price per annum is normal. Even obtaining satisfactory maintenance may be a problem in some countries to the extent that equipment is duplicated as an alternative.

However, if it is possible to obtain good maintenance support it is to be recommended despite the cost since the alternative may be to be without the equipment for months rather than a day or two.

It is important regularly to make back-up copies of all material stored. Working copies of software should be made and the master copies stored safely.

The 'shelf-life' of magnetic media is uncertain so new copies should be made regularly.

It may be possible to have furniture made locally to a specification, more cheaply than purchasing standard laboratory or office furniture.

6.3.3 Equipment for online information retrieval from remote computers

The basic equipment needed is a terminal, telephone and either an acoustic coupler or modem. A printer and an overhead projector which can project the image from the VDU screen (or one or more TV monitors) are desirable for teaching.

1. Terminal

For teaching the terminal should be preferably a visual display unit rather that a teletype terminal, since on the latter it is difficult to see the interaction that is taking place.

In setting up a dumb terminal for online use, the speed of operation, parity and duplex settings need to accord with those of the host (those should be stated in the host documentation) and the correct terminal type identifier should be used in logging on (which should be stated in the documentation from any telecommunications network used).

Although a 300 baud 'dumb' terminal is minimally acceptable for online searching, many teachers use more sophisticated equipment. In particular, microcomputers can be used as intelligent terminals so that searches can be prepared and stored offline and then sent with just one or two keystrokes when online; logging on can be automatic; data can be down-loaded in machine readable form and manipulated and higher data transmission speeds can be used.

Many hosts, for example Dialog, produce a special leaflet or instructions about using a microcomputer with their service (which indicate the type of communications interface necessary), and some produce special software. Special software for this purpose can be obtained from other suppliers (see the list of guides to software in Appendix III), whilst there are some dedicated microcomputers available with the software already built in, although this way of providing extra facilities has been largely superseded by the use of general purpose microcomputers with additional special software.

One of the advantages of using a microcomputer for teaching online searching is that it allows students to type in their searches offline so that slow, inaccurate typing is not so much of a handicap and the students are less likely to

be nervous. If the search strategy needs to be modified it is easier to log off, modify the search and log on again, because the automatic log on procedure is so much quicker than the manual one. Using microcomputers for teaching online searching is also in some countries, a better reflection of what occurs in practice.

It is possible to use the same microcomputer for online searching and other purposes but care has to be taken that changing from one activity to another is not unduly complicated and that there are not likely to be timetable or other clashes when the equipment is needed for two activites at once.

High speed operation may not be a great advantage in teaching since students are slow typists and need to think whilst online. However, it can speed up the display of records online and of course, is valuable if downloading is used.

2. Telephone

A direct dial telephone is to be preferred to one which is connected through a manual switchboard since human operators find it difficult to cope with data calls which they are likely to disconnect at an inappropriate time. However, it should be possible to work through a computerised switchboard perfectly satisfactorily, assuming it is set up correctly.

3. Modem or acoustic coupler

A modem is to be preferred if the equipment is to remain on one site but if the equipment is to be moved from site to site a modern acoustic coupler can be used. Older models of acoustic coupler were vulnerable to noise. It is possible to avoid using a modem at each terminal by working through a local area network which is connected to a wide area telecommunication network. For example, in Sheffield University (and other UK institutions) it is possible to search remote databases using a terminal connected to the university network which is connected to JANET (the UK universities network), which is connected to PSS (the national packet switched service) and so on.

4. Printer

If a VDU is used, a compatible printer is needed to record any records retrieved. Whilst online display facilities can be used to summarise the progress of a search it is usually more helpful and probably cheaper, to have a printout of the search. Additionally, students often like to take away a record of the search to study at their leisure (and as a souvenir).

Fortunately, suitable printers are in use in computer facilities in many countries but in teaching online searching, large volumes of data are printed so it is essential to check that the buffer is of sufficient capacity otherwise some of the output may be lost. It is also desirable to be able to use cheap, untracked paper (for

example, telex rolls) in the printer without it slipping. However, even printers which are supposed to be able to use untracked paper may not operate satisfactorily with it.

5. Overhead projectors connected to microcomputers

Only about four people can see a VDU screen at one time, so, for teaching larger groups it is desirable to use a special overhead projector connected to the VDU to show an enlarged image. One or more TV monitors can be used instead. There are also special projection facilities available (at substantial cost) where the image is projected either by back or forward projection. Specially designed wall brackets and TV stands are made for TV monitors.

6. Graphics terminal

A graphics terminal or a microcomputer with graphics facilities is needed for use with some online services where graphics have to be shown (for example, CAS Online which allows searching of chemical structures or the Dialog database Trademarkscan where trademarks can be displayed). Special software is available to allow input of chemical structures by drawing then rather than using notation, for example, Psidom and STN Express although these will only be of use to those with a strong chemical background.

6.3.4 Compact disc equipment

A microcomputer, compact disc player and a compatible printer are needed. The suppliers of each database on compact disc will provide information about which makes and models of microcomputer (with which operating system) and which compact disc player are needed to run their discs. Although some progress has been made towards standardisation, at present discs from different suppliers sometimes do not run on the same equipment. The supplier provides retrieval software on floppy disc as well as the compact disc itself.

It is useful to have a hard disc microcomputer so that the retrieval software can be stored rather than having to be loaded each time. Many compact disc databases utilise colour for highlighting and so on, therefore it is an advantage to have a colour version of the microcomputer.

Suppliers may offer package deals for equipment and disc, there may be discounts if the hard copy version of the database is held, old discs may be available free for teaching purposes and there may be discounts if more than one database is purchased from the same supplier.

At least one international organisation active in the development field (CEPIS) has arranged a bulk purchase of CD-ROM equipment for its members (including at least one university) at a substantial discount. It is to distribute its database to members in that form.

6.3.5 Computers for other online teaching

Microcomputers with floppy or hard discs, minicomputers and mainframe computers can all be used in teaching online information retrieval if appropriate software is available.

A local area network (LAN) can be a useful way of allowing multiple access.

It is important in choosing hardware and software to select that for which there is good support within the country. This may limit choice to:-

-the main computer manufacturers

-the computer companies which are well represented in the country

-to computers which are IBM PCs or compatibles

-to computers which use a well known operating system

-to software which is used in the country, and so perhaps to DBMS rather than FTX packages and office rather than library automation packages.

However, it may be worth finding out if any libraries or information units, including those in international organisations based in the country, have more specialist text handling packages which, if not too expensive, could be acquired by the teaching institution in full or demonstration form since some mutual support might be possible. The institution might, as an alternative allow its own software to be used in-house by students. Section 6.3.6 describes CDS-ISIS software which is available from UNESCO.

CALLISTO (Appendix III) indicates which computers the teaching packages it lists could run on at the time it was published, although it is known that some can now run on other computers and the list is quite out of date. It does however, indicate UK library and information studies departments which have experience in this area.

6.3.6 Videotex

The equipment needed will depend on the service or services available. For teletext a special television set with good reception and a remote control pad are needed whilst for interactive videotex a telephone, special television set or microcomputer (with interface software) and remote control and/or keyboard are needed.

Whilst the television set can also be used for normal purposes, such as showing videos, it is preferrable to have one dedicated to videotex use to avoid having to alter to settings and plugs frequently.

6.3.7 Audiovisual materials

There are a few tape/slide and video presentations on online searching (see Appendix III) but they date quickly. Finding what exists is difficult although the FID ET Clearinghouse at Syracuse University (see Appendix III) and other similar international or national centres may be able to help. The British Council is a source of suitable AV material in some countries.

Tape/slide presentations may be supplied with or without synchronising bleeps on the audio tape. It is possible to purchase a cassette player/recorder with a built in synchroniser (such as the Aldis Classette) so that the bleeps can be added and tapes with bleeps, played. It is important to make sure that the synchroniser is of the same standard as the synchronisation on the tape.

With videos, there is the additional problem that the tape has to be to the same standards as the video player and television set (VHS, Betamax Umatic, etc., and US NTSC or UK PAL standards). British Council offices often have UK standard video equipment and relevant videos. Some examples of videos on online searching are listed in Appendix III.

It is simpler to use an unsynchronised tape/slide than to try to play a video not made to the particular standards in operation in a country, if both tape/slide and video of the same material is available.

It is possible to record online searches on one track of a stereo audio tape and a voice commentary on another track. The resulting tape can be played on a modified cassette recorder linked to a VDU which displays the search. However, making the tape is very difficult and the procedure is not recommended now that computer assisted learning programmes are available or can be made.

Similarly the Mediatron device which was a valuable teaching aid a few years ago has been overtaken by other techniques.

Although some interactive videos are now being produced for teaching purposes, these are unlikely to be suitable for teaching in this area in the immediate future for the following reasons:-

-the master disc costs several thousand pounds to produce

-no data can be added once the disc is made so it is difficult to update the content of the teaching programme (especially any visual images)

-the workstations are expensive (about £4,000 each) and can only be used by one or two students at any time.

6.3.8 CDS/ISIS

This software from UNESCO is now used extensively in many countries for building databases of different types using IBM PC compatible micro-computers, WANG-PC and the DEC VAX family of mini and microcomputers. An implementation of the software is described by Neelameghan (1987). CDS/ISIS is an ideal package with which to teach the creation and searching of bibliographic, factual or numeric databases:-

-it runs on widely available microcomputers

-it is widely used in employing organisations

-it is very flexible in choice of record format

-it allows the integration in a single database of records of different types

-it is easy to use (menu driven)

Version 1 of CDS-ISIS was distributed free to many organisations.

7. PRACTICAL ASPECTS OF COURSE PLANNING AND ADMINISTRATION

7.1 Some of the factors which affect the design of a librarianship or information studies teaching programme wholly or partly devoted to online information retrieval

The national or regional requirement for people with the education or training planned should be established by attempting to answer the questions listed below. There is little point in planning a programme which is not needed. The answers should indicate if a different programme would be more appropriate and also give pointers to the content of the teaching programme.

1. National needs

What kinds of workers are needed in the information field and in what numbers? What is the need for users to have online information handling skills? What is the need for other professionals to be trained in online database design and construction?

Are other library and information work education and training programmes available? At what level(s)? How many are educated or trained each year? How well do they cover online information retrieval? Would the proposed programme simply duplicate them or does it have sufficient novel features?

What is the availability of information technology in the country? What plans exist for the future use of information technology nationally? What trends are apparent nationally and internationally in the use of information technology? What is the availability (and cost) of online information retrieval in the country (using remote services and within organisations)? What are the plans and trends in online information retrieval? What is the state of library and information service development within the country?

2. Educational factors

The educational pattern in the country and the particular institution in which the programme is to be based is likely to affect the design of all except short courses, since any formal educational programme for which a qualification is to be awarded by an academic institution is likely to have to conform, at least to some extent, to the pattern already established within the institution. For example, the duration of the programme and the division of the year into terms or semesters of a particular length is likely to have to be that laid down by the academic institution.

The existing qualifications, knowledge and experience of the potential participants must be taken into account in course design. It is important to build on what the participants know already, to avoid repetition and to identify what they do not know (in the area to be covered) so that it can be taught.

Teaching should be at a suitable level and pace for the participants and use appropriate methods.

It is usually possible to cover factual material more quickly and to achieve more active participation from those with higher educational qualifications and good practical experience.

Students whose first language is not English may experience difficulty in working with English language databases.

The qualifications, knowledge and experience (including teaching experience) of the potential teachers must also be taken into account. Subjects can only be taught if teachers are available who can teach them. It may be necessary to bring in people from outside to teach particular subjects or to delay a course until teachers can be trained or given the necessary experience.

3. Resources

The funding available (its level, duration, the type of programme for which it is available and the extent to which participants, if expected to, can pay) is likely to limit what can be offered. Substantial expenditure may be needed to purchase equipment and to maintain it.

The amount of time the participants can be spared from their work and the most acceptable pattern (for example, 1 day a week for ten weeks or 2 weeks all at once) affects course design as does the availability of teachers at a particular time and for a certain length of time (for example, if coming from overseas).

The online facilities available in the teaching institution and outside, including the budget for online searches, affect the amount of online practical work which can be done.

The other computer facilities (including software packages and teaching aids) available in the teaching institution and outside affect the amount of computer based practical work which can be done.

If only a limited number of teaching rooms is available or if some of them will not accommodate all the students at one time, these factors will affect the scheduling of teaching sessions.

The library facilities available affect the teaching methods which can be used for example, seminars are likely to be an inappropriate method if the students do not have access to published material so that they can prepare.

4. Duration

Clearly the amount of time available affects the amount of teaching, especially practical work, which can be done.

7.2 Practical work

Obviously the amount and range of practical work depend on the facilities and money available but every effort should be made to include as much as is appropriate for the particular course since it makes a major contribution to

learning. Section 4 gives an indication of what is suitable in some circumstances and papers by Neelameghan and Carino (1983) and Neelameghan and Pascua-Cruz (1983) give useful accounts of the ways in which different types of practical and other work have been integrated in courses at the Institute of Library Science, University of the Philippines.

The following activities should be considered:-

7.2.1 Online searching of remote databases

Live online searching of remote databases is likely to be expensive and can be unreliable but some experience of it should be provided, for all types of student, if possible.

Some hosts offer reduced rates or free time to library and information studies departments. For example Dialog has a Classroom Instruction Plan which offers searching of a wide range of databases for $15 an hour including the Dialnet part of the telecommunication costs. Other services such as Blaise and Datastar, offer some free use for LIS schools.

Some hosts, such as Dialog, make training files available at very low cost. These can be useful for teaching purposes but, since they are only subsets of the databases (often a few years old), they do not give a true picture of the results of particular search strategies. Some training files are so limited in the number of records they contain and the search facilities available, that they cannot be recommended for teaching purposes.

Representatives of hosts and database producers may be willing to do some training free of charge or at low cost.

Videotex systems can be considered as online information retrieval systems. If they are available in a country some way of showing them to students should be found. The connect time costs are substantially lower than for other forms of online retrieval and the retrieval systems are designed for naive users, both of which make them useful introductions to online searching, but it also means that they cannot be used as a substitute for using (in some way) other online retrieval services.

Ideally, librarianship and information studies students and some participants in professional education programmes, should have the opportunity to carry out real (that is, needed by an enquirer) searches online. This can be time consuming, especially if individual students rather than groups (perhaps pairs) of students do each search. It also requires a good deal of organisation by the teacher. Students need to know something of the subject area of a search to be capable of producing good results.

As an alternative to involving an enquirer, students or continuing education participants can do searches of interest to themselves, perhaps on a topic set for coursework or on a topic in which they are interested but which is outside the LIS field. End users benefit from trying a search or searches in their own subject area especially on their own research topics if appropriate.

Those doing real searches are unlikely to use all the features which they should use nor will all the students in a

class use all the same features, therefore other practical work is needed to complement real searches.

Students searching online remote databases experience some of the pressures that intermediaries encounter, in particular the pressure of time costing money. Whilst no-one would wish students to become over-anxious (and care should be taken that they do not), these factors do add to the realism of the work.

Search exercises can be carried out online to make sure that all students have used particular online facilities but they can be time-consuming (even if small groups work together). Sometimes exercises can be taken from host workbooks.

At least at the beginning, students need one supervisor to each terminal when they are carrying out live online searching of remote databases either of real searches or prepared exercises. This is partly to give confidence that help is at hand if things go wrong and partly because mistakes can be expensive for the institution.

Live demonstrations of online searching can be given by the teacher. They are useful in showing all of the group the same features at the same time and can be the cheapest way of teaching using live online remote services. All demonstrations should be prepared in advance and tested online. Telecommunication or host systems failures can be a problem during demonstrations so the teacher should be prepared to do something else and to re-schedule the demonstration. It is important that students can see what is happening (see section 6.3.3).

7.2.2 Compact disc

CD-ROM technology is likely to make a big impact on the teaching of online information retrieval since it allows live hands-on use in-house. There is no need for telecommunication links which even if they are available may be costly and unreliable. Another advantage of the use of CD-ROM in teaching is that use dependent costs are very low. In teaching, the lower frequency of updating the database compared to the normal online version, is unlikely to be a problem.

The search software is designed mainly for end user searching so it is simpler (often menu driven) than the command languages of "normal" online services. Whilst this means that searching is easier to learn, the techniques may not be as effective as in conventional online searching.

Because there is less pressure to complete searches quickly, browsing is a real possiblity. Newer versions of the retrieval software may be faster and have improved search facilities compared to the original versions. Some online hosts such as Dialog also sell databases on CD-ROM and their search software has much in common with their normal online command language. This can be an advantage in teaching.

The cost of leasing each database on CD-ROM is substantial ($990 annual subscription for LISA, one of the cheapest) so teaching organisations are only likely to be

able to purchase a limited number of databases in this form although discounts may be available if additional databases are purchased from the same supplier.

Course participants may be able to use CD-ROM on visits to libraries or information services. Commonwealth Agricultural Bureaux International is at present experimenting with the distribution of its database on CD-ROM to agricultural institutions throughout the world.

Unless the teaching organisation can afford to purchase multiple sets of equipment (see section 4.6.3) throughput will be slow as only one search can be done at a time and only a maximum of four people can see what is happening at once.

This facility is particularly useful for unsupervised searching by students seeking references to be used in the preparation of coursework and dissertations. This kind of searching is most valuable in increasing awareness and confidence in using databases.

7.2.3 Searching of conventional inhouse databases

These can be databases built by students and/or staff or leased from database suppliers. They can be in other organisations which allow students to use their facilities on a formal basis. The advantages, as with CD-ROM databases, are that the use dependent costs are very low and there is no need for telecommunications links.

Databases built by staff and/or students are likely to be too small to model the large databases available from the major producers. For even a narrow subject area a database of several thousand records is needed to show something approaching the retrieval power of commercial online services. Even such a database cannot show the subject range of bibliographic and nonbibliographic databases which is available.

Designing and building a database is, itself, a valuable exercise.

Large databases require appropriate hardware and software on which to run. Therefore, apart from the (normally) substantial cost of the database itself (several thousand pounds sterling a year), the hardware and software costs are likely to be high also.

Even with access to a large database such as CAB (Commonwealth Agricultural Bureaux) or AGRIS, course participants still need to be taught about the full range of relevant databases available. However, online practice with a large database is valuable in teaching the basics of online searching.

If possible, arrangements should be made for students to input records to an inhouse database as well as to study the design of the database and to prepare input for it.

7.2.4 Design of and input to inhouse databases

Apart from any work on personal databases, this aspect is unlikely to be of interest to end users.

As indicated above, valuable practical work can be arranged if appropriate software is available. If possible both free text (FTX) and database management systems (DBMS) should be used so that students can compare them. Some software is available quite cheaply or even free, whilst other software is available in demonstration or test disc form (see Section 6.3.5) Examples include CDS/ISIS, MIRABILIS, INMAGIC, Microcairs, Dbase III and Basis.

Demonstration discs often contain small databases but normally cannot be used to produce working databases. This is often true also of low cost expert system shells which have demonstration expert systems. Even so they can be useful in teaching.

7.2.5 Computer assisted learning facilities

The different types of computer assisted learning package are described below. One major advantage which most, apart from interactive video, have is that it is possible to provide many students with individual access at one time. Since most CAL programs are self explanatory far fewer staff are needed for supervision than with online searching itself. One supervisor can usually oversee at least ten students. After an introductory supervised session students can often be allowed to use the package unsupervised.

Some hosts are now beginning to produce computer assisted learning (CAL) packages about their services, for example the National Library of Medicine has produced an inexpensive CAL disk about some of their toxicity services, which runs on an IBM PC. STN has produced a four free programs (STN Mentor) about their services which run on an IBM PC and Datastar has produced a similar disc. Whilst these programs are obviously of most use to those who are likely to search the databases concerned they give good introductions to online searching in general but the databases used as examples may be unsuitable for some potential users (see Appendix III).

1. Computer simulations of online searching

These are specifically produced to aid the teaching of online searching. They may be main-frame, mini or microcomputer-based software packages which contain guided sample searches of particular host services or databases. Apart from the guidance given and, sometimes, self assessment modules, simulations look very much like the online services. They are not constructed with an actual database, so only the sample searches can be performed.

Simulations are useful in letting students practice using the keyboard (a skill not to be under-estimated) and basic commands at very low cost, especially if several microcomputers or computer terminals can be used simultaneously. They show how searches can be constructed but users cannot practice search construction for topics of their own choice and the sample searches may not be appropriate in subject matter to the group being taught. However, students can gain confidence before they go online

at almost no connect time cost and independent of telecommunications.

They are particularly useful for students who have no practical experience of online searching but they can also be useful for revision if the user has not been online for some time. In a well designed simulation the searches increase in difficulty and the amount of help decreases as the program is worked through. They can be invaluable for teaching a searcher the commands of a service with which he or she is unfamiliar. As a last resort, simulations can be used to give an impression of online searching if live online searching cannot be used either because it is not available or is too expensive. DIAL-SOS and QUESTSIM are examples of simulations which are described briefly in Appendix III. Simulations are simpler than emulations to produce and they can be small enough to be stored on floppy discs.

2. Computer emulations of online searching

Although the terminology in this area is rather vague, these are taken here to be software packages which have a command language similar to that of the service being emulated, together with a database which can be searched. Some authors (Large and Armstrong, 1985) call them systems simulations. They can be used to practice all aspects of online searching on a particular host and as a last resort, as a substitute if live searching cannot be used.

Because there is a database, users can construct their own searches but there may not be as much guidance as in a simulation, so beginners may 'get lost' in the system. However, some emulations also have some simulated searches which can be used by absolute beginners and have extensive 'help' facilities.

Emulations also have limitations; hosts have sophisticated command languages which some emulations do not copy fully and the database needs to be large to show the same sort of retrieval power as the system being emulated. Some emulations are not large enough so that it is difficult to use even one Boolean AND in a statement and retrieve postings. Emulations need to be installed on at least a hard disc microcomputer to have space for a large database. The alternative of a small database on a very narrow subject is sometimes used.

Because of the extra effort needed to construct emulations, they normally are more expensive than simulations but running costs are very low.

O. S. T. (Online Search Tutor) described in Appendix III is an example of an emulation with some simulated searches included as well although the package being sold at present does not include the emulation. TRAINER (University of Pittsburg) and DIATOM (Syracuse University) are examples of main frame emulations of commercial services.

3. Novel retrieval systems

Only one example of a teaching package to show novel information retrieval methods is known, this is INSTRUCT,

which is briefly described in Appendix III. This can be used to provide online practice at very low connect cost. The system shown is not like any of the commercial online services, although, some of the online services and online public access catalogues (OPACs) have recently introduced a few features which utilise some of the retrieval methods shown by INSTRUCT.

4. Sample expert systems

These are useful in support of a course such as that described in Section 4.9. They contrast strikingly with information retrieval systems. Systems such as Animal and Doctor using ESIE are designed for the non-specialist although even these require some general knowledge of animals and medicine which is sometimes lacking (for example, it is necessary to know that elephants are vegetarian and what an opposable thumb is). Some difficulty was encountered in using them with students whose first language is not English but this was largely overcome by the use of dictionaries. A brief description is included in Appendix III

5. Other computer assisted learning packages

A few such packages exist but most are tied to computers which may not be widely available. Online Retrieval (University of Sheffield) was produced using the Microtext authoring language of the BBC Microcomputer. Simple CAL packages, such as those produced using Microtext, can increase their users' keyboard skills but they are limited in what they can show on each screen so the detail and subtleties of a subject is lost.

Getting started: an introduction to microcomputers for librarians (Soft Option) is an interactive videotape and so searching for information is more restricted than with interactive videodiscs.

Most interactive videos are interactive videodiscs. These are considered by some to have great potential for teaching. However, they are not a practical proposition for most LIS schools at present since the cost of cutting the master videodisc is very high; the cost of the equipment is substantial (£4,000) for each unit; it is impossible to add new material to the disc; and the equipment configuration is likely to be unfamiliar in many countries.

Teaching aids can make a useful contribution to the teaching of online information retrieval but they should be considered as complementary to other ways of teaching, such as actual hands-on experience, rather than as substitutes.

7.3 Making teaching aids

Unless there is nothing suitable which will run on the computers which are available, making teaching packages is not recommended.

An existing teaching aid may be unsuitable because it cannot be used with the computer available, because it is in

a language with which the students have difficulty or because the content is not suitable. The last is probably the most important reason for rejecting a program since it is often possible to convert a program so that it will run on another computer or to translate the text but it is likely to be difficult to alter the content substantially.

If the program is written in a common language like BASIC (although the different dialects can be a problem) or PASCAL and uses a common operating system, it increases the chance of it being transferable. At the present time programs written for IBM PCs or compatible computers are the most portable. If buying a teaching package which will need alteration, it is necessary to have the source program as well as the compiled version.

Preparing teaching aids is a time-consuming and expensive task (Wood, 1985) for example, each of the fairly simple simulations such as DIAL-SOS produced at the University of Sheffield, took four months of full-time work from one person to produce, whilst the much more sophisticated package INSTRUCT, took eighteen months of full-time work even though programs for some of the routines were already available. The Sheffield simulations could only be made because taught course MSc students produced them for their dissertations and financial support was provided by a variety of outside organisations. INSTRUCT could only be produced with substantial financial support from the British Library.

Teaching aids need to be updated:- to reflect changes in the system being shown, to avoid displaying old references and to reflect changes in the technology. Updating can be a time consuming process.

If the decision is made to produce a teaching package, it is essential to:-

1. Obtain the permission of the host and database producers of any service being copied.

2. Ensure those involved have the necessary knowledge of online searching (especially of the services to be taught), teaching online searching, programming and of the computer to be used.

3. Ensure that sufficient money is available to pay for the online time, database, discs, etc.

4. Plan to a timescale.

5. If there is a choice, use the computer or computers in the particular institution which can support most users at once . This makes the package more economical in teaching staff time.

6. If there is a choice, use a common programming language and operating system (especially if it is hoped that other

institutions will use the package). At the present time, consider using an IBM PC or compatible machine.

7. Identify the most important features to be included and concentrate on them. Do not try to include everything. Students can only learn a limited amount at one time and learning increases with repetition.

8. Write clear, concise, unambiguous instructions.

9. If preparing an emulation, make sure the database is big enough and is on a suitable subject. It may be possible to obtain a subset of a database from a database producer.

10. Try to include an element of self assessment in the package so that users can determine what they have learned. It is not usually appropriate for this assessment to be recorded for use by the teacher in measuring the performance of individual users.

11. Test the system with volunteers before it is considered to be finished.

12. Document the programs properly, especially the technical aspects so that modifications can be made later.

13. Write a short user guide (pocket size) with basic instructions such as logging on and off and error correction so that users do not have to note these details down from the screen or repeatedly try to find them online.

14. Write a teachers' guide.

15. Regularly review the teaching aid and ask users to evaluate it.

16. Update it regularly.

7.4 Planning practical sessions

1. Practical work should be timetabled close to the other teaching sessions on the same subject.

2. Careful design and preparation are necessary.

3. Student instruction sheets are be needed. (Some examples of these are included in Appendix III).

4. Exercises and demonstrations need testing beforehand.

5. All equipment should be assembled (if necessary) and tested before practical classes.

6. Adequate supervision is needed. For hands on searching of remote online services this means one supervisor per terminal when the students first start to search, although

this can be reduced later. For use of simulations, one supervisor to ten or even more terminals is all that is needed. The supervisors should understand fully the work being done and so be capable of answering even complex questions about it. Although graduate assistants or demonstrators can be used they need to be properly briefed.

7. Several sessions may be needed to allow all students to do a particular piece of practical work. As an illustration, if there is only one set of equipment and there are twenty students who work in pairs, ten sessions are needed to enable all the students to do the work.

7.5 Setting up an online service for teaching

It can be difficult to know how to arrange for access to remote online search services, especially in a country where the facilities are not widely available. Probably the best suggestion is to identify the person responsible for the online service in an organisation which already has the facilities and find out how he or she made the arrangements.

Appendix III lists some guides to going online and the equipment is described in section 4.6.4.

Apart from the equipment the following are needed:-

A contract with a host who will then provide a password. The host is likely to know whether it is accessible from a particular country.

Telecommunications network and equipment

The host may have information on networks. The post and telecommunications authority of the country should have information about networks and may sell or lease equipment. They may have to install the modem and telephone. It may be necessary to have a contract with them for access to a national telecommunications network. In some countries some of this work is done by private companies. If it is known that some organisation in a country searches remote online databases, however infrequently, it is recommended that contact is made with it to find out the local situation.

7.6 Budget and administration

Running an online searching laboratory with access to remote online services is likely to generate the following costs:-

Start up costs

-equipment purchase and installation

-joining fee (only for some online hosts)

-documentation

-staff training

Running costs (use independent)

-leases, rental, maintenance and insurance

on equipment

-network charges

-purchase of manuals, etc.

-staff, salaries, overheads and training costs

-host subscriptions (only some hosts)

Running costs (use dependent)

-connect time costs for the telecommunications network

-connect time costs for the online host

-segment (packets) charges for the

-telecommunications network

-online print charges

-offline print charges

-stationery

The invoices for these expenses come in with different frequencies, from different sources and probably in different currencies.

There are a number of guides to setting up an online search service (see Appendix III). Although these are written for those introducing online searching into libraries and information services in the United Kingdom and are not specifically geared for those who need the facilities in order to teach online searching, they are worth consulting.

There are a number of guides to choosing software for libraries, a few of which have been listed in Appendix III, although almost all these are written mainly for the United Kingdom market.

Some software for teaching in the online field is described in Appendix III. CALLISTO which is also listed in Appendix III is a useful (but dated) selection tool and source of contacts who have experience of teaching in the field.

Online hosts often offer concessions to teachers of online searching. These may include free online time, such as Datastar's offer of one free hour online per student per term or reduced rates such as Dialog's Classroom Instruction Plan (searching of most Dialog databases at $15 an hour and Dialnet use free). Understandably such concessions are given on condition that certain terms are observed (such as the search results cannot be sold and that offline prints are not available). Some hosts and database producers offer documentation free or at a reduced rate.

Co-operative approaches can help in attempts to obtain special rates.

In choosing hosts and databases to use for teaching the following points should be considered:-

1. What is available in the country.

2. The subject backgrounds and needs of students. If these are very varied, it is better to choose a host with a wide range of databases even if it is more expensive. This avoids students (and teachers) having to switch frequently from one command language to another.

3. Cost.

Even teaching online searching can create an increased demand for library services such as inter-library loans and this can make an impact on library costs.

7.7 Staff

Clearly well qualified and experienced teachers are necessary. Sometimes service teaching has to be obtained from other departments (such as computer science) to supplement inhouse resources. This can be successful if the service teacher is carefully selected for willingness to adapt his or her teaching to suit the background and needs of the group and if the information studies staff explain carefully what is needed and spend time giving the service teacher an insight into information studies. It is no good if the service teacher does not adjust and, for example, uses only mathematical examples with innumerate librarians. Some institutions require a multidisciplinary approach to teaching so that service teaching is the norm rather than the exception.

Practising librarians and information workers can make a valuable contribution to a teaching programe although their use can make scheduling teaching sessions more complicated.

Trainers from online hosts, software vendors and database producers may be willing to participate in teaching. This can be particularly useful if teaching staff are not experienced searchers and if resources are particularly limited. However, care has to be taken that teaching sessions do not become selling sessions, although most trainers are themselves careful about this. Often trainers will provide free online access or demonstration software.

Graduate students can be used as 'demonstrators' in practical sessions, provided that they are sufficiently knowledgeable and experienced. It is important that they are also good teachers, willing and able to help students. In some institutions money is available from a central fund to pay demonstrators.

It is desirable to have access to suitable technical support staff who can help set up equipment, load software, correct bugs, write programs, and maintain software, hardware and documentation. A systems operator is likely to be needed

even for normal commercial software and hardware. Although some teachers have the necessary expertise to do this work they do not have the time to do the work properly. Proper technical support in-house is even more important when the suppliers are remote, unreliable, unskilled or cannot obtain spare parts.

It is difficult to say how much support is needed but one programmer on call when required, and spending in addition, a half or a full day a week in the teaching laboratories would suit an organisation with up to ten microcomputers and a wide range of software to run on them. This arrangement is feasible if the teaching unit is part of a larger establishment.

As Section 7.6 indicates, online work generates a wide variety of invoices, probably in different currencies. Administrative support is likely to be needed to cope with these and other administrative aspects.

7.8 Teaching methods

Online information retrieval should be taught using a range of teaching methods. Using a variety of teaching methods within the teaching programme is likely to enhance it.

Lectures are useful for imparting a large amount of factual material quickly.

Seminars based on students presentations (in part based on reading) are useful for allowing students a choice of subject but still enabling them to share what they know with colleagues. Seminars are best for less important, fairly straightforward topics.

Discussions perhaps based on small groups talking amongst themselves and then reporting back to the main assembly are useful for less factual, more controversial areas. Brainstorming is a variation of this technique.

Small group work or tutorials are useful if students are working on different topics and/or if the material is particularly difficult.

Case studies are helpful for topics such as the reference interview, management and information policy.

Practical work is probably the most valuable teaching method and a variety of possible exercises is indicated in Section 4.

Research assignments, coursework and dissertation projects are important for both student assessment and as especially valuable methods of learning. It is beneficial for students to have a choice of topic.

7.9 Visits and visiting speakers

7.9.1 Visits

Visits to working online information retrieval services can make a great contribution to a course of any kind or at any level. Visits are particularly important if the facilities of the teaching institution are limited.

Great care, skill and determination are needed to identify suitable organisations, especially in countries

where the online information retrieval facilities appear limited. International organisations, if there are any based in the country, often have such facilities. It is important to widen the search beyond traditional library and information units to other organisations which clearly have large information handling requirements and so often have computer-based facilities to aid them.

Visits are especially important for those in basic or continuing professional library and information studies education since they provide an opportunity to meet practitioners who are already using advanced methods of information retrieval. These contacts can form the basis for future meetings and exchange of experience. Often professionals do not have the time or opportunity to visit other organisations to see what is being done, so the provision of this opportunity on continuing education courses is greatly appreciated. Visits are likely to show much more than just the online retrieval facilities and this is an advantage since they will then contribute to the broader education of the participants and place what is taught about online information retrieval in a wider context.

To be successful, visits have to be properly organised:-

1. Although the first approach is best made by telephone, this should be followed by a letter to a named person (who will be responsible for the visit within the organisation to be visited) giving full details of the visit, stating the timing of the visit, what it is hoped to see, what level of knowledge the visitors have and enclosing a list of the visitors with their background and affiliations.

2. If the organisation has not been visited before, the teacher should visit the organisation, before committing the group to a visit, to check what there is to see and to discuss the visit.

3. Adequate transport arrangements should be made and a schedule for the visit established.

4. The visit and its schedule should be announced to the participants. If possible, attendance on visits should be compulsory so that any funding organisations can provide financial support, and there is greater incentive for participants to attend.

5. A simple pattern for a visit is:-

   -a short introductory talk by a senior member of the organisation's staff (NOT more than 15-20 minutes) explaining the nature of the organisation and what is to be shown.

   -tours of the facilities in small groups (NOT more than 10-12 in a group) each accompanied by a knowledgeable guide, with demonstrations of online input, retrieval and so on where appropriate.

-a question and answer session with with senior members of staff (up to 30 minutes duration) and an opportunity to express thanks for the visit.

6. A follow up discussion session should be arranged soon after the visit. This gives an opportunity for the teacher to make sure that the students fully understand what was seen on the visit and perhaps for a more critical discussion than was possible during the visit itself.

7. A letter of thanks to the host organisation can be used to provide feedback about the visit.

8. Usually organisations do not charge for visits.

7.9.2 Visiting speakers

Carefully selected and briefed outside speakers bring a valuable air of reality to a course. They can discuss their own practical experience of online information retrieval (and other aspects) which complements the teaching given by others. As with visits, the choice need not be limited to libraries and information services, since people working in other types of organisation often have relevant knowledge. For example computer specialists or those in the telecommunications fields can be particularly useful, especially if they know about national developments.

However, it is vital to make clear to the speaker the level and content of talk which is required, and what the students know already. Those invited to speak should be known to be good speakers. The talks of visiting speakers should be scheduled so that they occur close to other teaching on the same subject.

It may be necessary to pay fees to visiting speakers although those from online hosts or database producers usually do not charge, since they see the importance of talking to potential customers.

7.10 Field work or practical placements

These relate especially to basic profession education where students are required to undertake one or more periods of work experience prior to the teaching programme, during the programme or at the end of the programme. Students should be provided with varied practical experience so that they see the full range of activities of the unit in which they are placed. They should not be considered as cheap labour and assigned to one routine task (even if it is typing in input to a computer database). They should see (and if possible do) some of the tasks indicated in these Guidelines. From this it follows that the organisations which are chosen to provide placements should be selected with care and that student placements should be carefully supervised.

Some library and information studies departments do not insist on practical experience either prior to or during the programme, others simply require a period of "approved" work

or research experience which is not necessarily in the librarianship or information work field.

7.11 Evaluation

7.11.1 Evaluation of teaching programmes

Any teaching programme should be evaluated by both teachers and participants, to provide information on which to base decisions about future teaching. The Guidelines by Lancaster (1983) provide a sound basis for deciding how to evaluate a programme.

More than one technique should be used in evaluating a programme, for example, to hold both a programme review and to use a questionnaire.

It is worth remembering that one group of participants may react very differently to another group, when presented with the same programme, and that an individual's views may change over a period of time. Therefore, it is wise not to rush to make changes based on feedback from only a few participants or from only one running of the programme.

Professional organisations or small groups of practitioners can contribute to the evaluation of teaching programmes and also to the planning of new or revised programmes.

7.11.2 Evaluation of students

For students on basic professional education programmes evaluation will have to fit in with that for the programme as a whole. If possible more than one piece of work should be assessed and the pieces assessed should be of different kinds (for example, coursework, dissertation and examination). Practical work, especially online searches, are difficult to assess since there are so many variables and what is a good search is often debatable. However, they are useful for testing students' understanding of the techniques and as the basis for discussion.

For participants on continuing education programmes there may not be any assessment except perhaps of attendance, with the withholding of the certificate of attendance as the sanction. If the programme is substantial then it is appropriate to assess essays, reports and/or some practical work.

For end users who are students, work set in their main subject for which an online search for information is needed can be assessed. For the remainder, it is unlikely that any formal assessment is necessary or appropriate.

7.12 Teaching staff training

Staff may need additional training before they can teach these subjects. This can involve secondment to libraries or information services which have the facilities so that the teachers can gain hands-on experience. It can involve visiting, or, preferably studying in, institutions overseas which have sound practical experience of teaching in these areas and if possible, with staff who have experience of teaching in other countries.

It is essential to remember that staff will need to keep up to date in a rapidly changing subject area. This is likely to require further staff training at regular intervals, in many cases in other countries.

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APPENDIX I

LIST OF ENGLISH LANGUAGE JOURNALS

NOTE 1: Titles marked * are considered to be the most useful sources of papers for students on this topic, although they include journals of varying standards containing papers of different levels.

NOTE 2: Many of the other journals are mainstream library and information studies journals which occasionally have relevant papers, these are marked +.

NOTE 3: Access to a few news journals is important. Some of these are listed.

NOTE 4: Some of the other periodicals listed must be considered as luxuries for organisations with substantial library budgets.

NOTE 5: In most countries relevant non-English language journals will be required in addition to English language journals.

NOTE 6: Abstracting and indexing journals and general scientific journals are excluded from this list.

NOTE 7: Prices are indicative only.

ACCIS Newsletter
(ACCIS = Advisory Committee for the Coordination of Information Systems)
The Editor, ACCIS Newsletter, ACCIS Secretariat, Palais des Nations, CH 1211, Geneva 10, Switzerland. Free.
(news items)

*Annual Review of Information Science and Technology
(North Holland) Elsevier Scientific Publishing BV, PO Box 1991, 1000 BZ Amsterdam, Netherlands. $52.50 per annum.
(the main review journal covering the field)

Aslib Information
Aslib, Association for Information Management, Information House, 26/27 Boswell Street, London, WC1N 3JZ, UK. Free to members of the Association.
(newsletter-mainly of UK activities).

*Aslib Proceedings
Aslib, Association for Information Management, Information House, 26/27 Boswell Street, London, WC1N 3JZ, UK.
Free to members of the Association. Annual subscription to non-members £50 UK/£60 overseas (1987).
(General information management journal which often has relevant, papers based on practical experience which are very good for student readings).

Bitstream
Citech Ltd, PO Box 565, Iver, Bucks SLO OQZ. £24.
(Monthly newletter covering advances in managing images and text by electronic methods)

CD-ROM/Optical Publishing Report
Headland Press, 1 Henry Smith's Terrace, Headland, Cleveland TS24 OPD, UK.$195 outside UK
(News items in the field. Monthly with ring binder).

CTI Communication Technology Impact
Elsevier, PO Box 1991, 1000 BZ Amsterdam, The Netherlands.
A newsletter for publishers and information handling organisations.

*CODATA Bulletin
Pergamon Press, Headington Hill Hall, Oxford OX3 OBW, England.
(data activities).
$55 including Proceedings of the Annual Conference, itself a useful source.

*College and Research Libraries
Association of College and Research Libraries, 50 E. Huron St., Chicago, IL 60611, USA. (non members $45 per annum).

*Database
Online Inc., 11 Tannery Lane, Weston CT 06883, USA. Subscription: USA and Canada $85; Mexico $100; other (airmail) $120.
(News, comparisons and evaluations of databases)

Database Searcher
Published by Database Searcher, Dept VV, PO Box 3000, Denville, NJ07834 (North and South America and elsewhere Meckler Publishing, 3 Henrietta Street, London, WC2E 8LU, UK. $49.50 plus postage. (News and short articles).

(*Documentaliste Science de l'Information
ADBS, 5 avenue Franco-Russe, 75007 Paris, France. (France 345F. Overseas 400F).
One of the major French language journals).

Electronic and Optical Publishing Review
Learned Information, Bessesleigh Road, Abingdon, Oxford, OX13 6LG, UK. £41 p. a. (plus £8 airmail).

Education for Information
Elsevier, PO Box 1991, 1000 BZ, Amsterdam, Netherlands.

Electronic Library
Learned Information, Bessesleigh Road, Abingdon, Oxford, OX13 6LG, UK. £46 plus £8 airmail delivery.
Mini and microcomputer and software applications in libraries.

*Expertise
(Journal of the Strathclyde Business School, Department of Information Science, Glasgow, Scotland). For expert systems.

*IAALD Quarterly Bulletin
(International Association of Agricultural Librarians and Documentalists)
c/o Drs J. van der Burg, Secy, PUDOC, PO Box 4, 6700AA Wageningen, Netherlands, $60 to non-members.
(Sometimes has new items and papers about online information in the agricultural field but useful for agriculture in general)

IES News
(Esprit Information Exchange System)
published for DGXIII Telecommunications, Industries and Innovation of the European Economic Community by the European Institute for Information management, 13 rue de Bragance, L-1255 Luxembourg.

*IFLA Journal
(International Federation of Library Associations)
K. G. Saur, Heilmannstr. Munchen 71, Federal German Republic. DM 120 to non-members.
(often has papers on information technology in less developed countries or on international aspects)

Information Media and Technology
£62 (including airmail) from CIMTECH, Hatfield Polytechnic, PO Box 109, College Lane, Hatfield, Herts, AL10 9AB, UK.
(Emphasis on storage media such as CD-ROM)

*Information Processing and Management
Pergamon Journals Inc, Fairview Park, Elmsford, NY 10523, USA.

+Information Technology and Libraries
Library and Information Technology Association, 50 E. Huron St, Chicago, IL60611, USA. non-members $17.50.

Information Today
Learned Information, 143 Old Marlton Pike, Medford, New Jersey. $24 US, Canada and Mexico, $48 airmail to all countries outside USA, Canada and Mexico.
(Newsletter)

Information World Review
Learned Information (Europe) Ltd, Woodside, Hinksey Hill, Oxford, OX1 5AU, UK. £18.
(News items on all aspects of online).

*International Online Information Meeting Proceedings
Learned Information (Europe) Ltd, Woodside, Hinksey Hill, Oxford, OX1 5AU, UK. Annual (1987 price £50)
(Papers of varying quality but many are very good for student readings)

ITS News
Newsletter of the Library Association Information Technology Group. Free to members. Non-members should apply to the Editor (1987) Mark Jewell, School of Management, Cranfield Institute of Technology, Bedford, MK43 0AL.

*Journal of the American Society for Information Science
John Wiley, 605 Third Ave, New York, NY 10158, USA. $130.
(One of the leading information science journals, it often contains relevant papers)

*Journal of Chemical Information and Computer Science
American Chemical Society, 1155 16th St NW, Washington DC 20036, USA. Non-members $100.
(Sometimes has papers on online in the very broad field of chemical information and is the journal for chemical information in general)

+Journal of Documentation
Aslib (Association for Information Management) Information house, 26-27 Boswell Street, London, WC1N 3JZ, UK. Non members £50 UK £65 overseas
(Occasionally has relevant items, especially in the Progress in Documentation review section)

*Journal of Information Science
North Holland, Elsevier Scientific Publishing BV, PO Box 211, 1000 AE Amsterdam, Netherlands. Dfl 215.
Many relevant papers.

+Library Association Record
Library Association, 7 Ridgmount Street, London, WC1E 7AE, UK. Non-members UK £53 Outside UK (except N. America) £62. N. America $123.
(Rather light weight and UK biassed). Corporate LA membership ensures access to other LA publications.

+Library and Information Science Research
Ablex Publishing Corporation, 355 Chestnut Street, Norwood, New Jersey 07648, USA. Institutions $55 plus $11 overseas.

Monitor
Learned Information, Oxford. £98 per year
News items analysed (12 pages each month)

(*Nachrichten fur Dokumentation
VCH Verlaggesellschaft, Weinheim, FDR. DM 135.
One of the major German language journals in the field).

*National Online Meeting Proceedings
Learned Information, 143 Old Marlton Pike, Medford, New Jersey, USA.
(Of similar standard to the International Online Information Meeting proceedings)

Netlink
Aslib, Information house, 26-27 Boswell Street, London, WC1N 3JZ, UK. Subscription £15.
(Journal on local area networks).

News from Microinfo
Microinfo Ltd, PO Box 3, Newman Lane, Alton, Hants, GU34 2PG, UK. Free.
(This is a tool for selecting NTIS, World Bank and other reports, some of which are relevant to this field).

Newsletter on education and training programmes for information personnel
FID, PO Box 90402, L509 LK, The Hague, Netherlands.

*Online
Online Inc, 11 Tannery Lane, Weston, CT 06883, USA. US and Canada $85, Mexico $100, Foreign airmail $120.

Online Access
Access Publishing Group, Inc., 53 West Jackson Blvd, Chicago, Il 60604, USA. $24.95 (plus postage outside the USA)
(Online business information magazine with US slant).

Online Notes
Aslib, Information House, 26-27, Boswell Street, London, WC1N 3JZ.
(News of online matters, strongly UK slanted but some more general information. Some special guides, priced separately, are useful).

*Online Review
Learned Information, 143 Old Marlton Pike, Medford, New Jersey, USA.
(News and papers which are often on practical aspects of online searching)

Online Sci-Tech Information
Headland Press, 1 Henry Smith's Terrace, Headland, Cleveland, TS24 OPD, UK. £89 plus post and packing
(Newsletter evaluating databases)

Perspectives in Information Management
Butterworth and Co (publishers)Ltd, Borough Green, Sevenoaks, Kent, TN15 8PL. Approx. £40.00.
Annual review starting 1988.

*Program
Aslib, Information House, 26-27 Boswell Street, London, WC1N 3JZ, UK. £50 members, £60 others.
(Especially useful for accounts of systems and services in operation and for the results of recent research).

RQ (Reference Quarterly)
American Library Association, 50 E. Huron Street, Chicago, IL60611, USA. $25.

VINE
Library and Information Technology Centre, Polytechnic of Central London, 235 High Holborn, London, WC1V 7DN, UK. £33.50 UK, £44 overseas airmail.
(Newsletter on library and information technology)

APPENDIX II

SELECTED ENGLISH LANGUAGE READINGS

NOTE: These readings are arranged under the same headings as Section 4 of the Guidelines

Contents

Readings (English language except for a few in Spanish and French)

An introduction to online searching 2

Computer and telecommunication basics 4

Information retrieval basics 6

Searching using online services 8

Databanks 10

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Other electronic publishing 13

Artificial intelligence and expert systems 15

Inhouse databases design, construction and use 17

The marketing and promotion of databases and services 19

Online cataloguing services and OPACs 20

Managing an online information service 21

The policy aspects and economics of online and International issues and local problems 23

User education 26

Online sources for particular subjects 27
Science and technology 27
Sources of business information 27
Sources of information in chemistry 27
Sources of information in biotechnology 28
Sources of information for agro-industry 29

An introduction to online searching (4.1)

FUINCA Bases de datos. Retos, oportunidades y esperanzas. Madrid, FUINCA, 1985 (In Spanish).

HENRY, W. M., LEIGH, J. A., TEDD, L. A. and WILLIAMS, P. W. Online searching an introduction. London, Butterworths, 1980.
(Good basic textbook, somewhat out of date, examples based on the UK situation).

HOUGHTON, B. and CONVEY, J. Online information retrieval systems. 2nd ed. London, Bingley, 1984.
(Textbook-first part a very brief introduction to online searching (53 pages)-second part consists of an explanation of searching on six host systems, examples based on the UK situation)

MEADOW, C. and COCHRANE, P. A. Basics of online searching. New York, Wiley, 1981.
(Good basic textbook, some inevitable US bias, rather dated).

MINISTERIO DE CULTURA y FUINCA Las bases de datos, a simple vista Madrid, FUINCA, 1986 (In Spanish).

PARKER, C. C. and TURLEY, R. V. Information sources in science and technology. 2nd ed. London, Butterworths, 1986.
(a guide to sources of information but it includes a substantial section on setting up an online search service, sections on online searching and some guidance on online databases for scientific and technological subjects).

RAITT, D. An introduction to online information systems Oxford, Learned Information, 1984. (Collected papers published 1979 or later).

ROWLEY, J. E. Organising knowledge. An introduction to information retrieval. Aldershot (UK), Gower, 1986. (ISBN 0 566 034867).
(a useful textbook covering the broad field of information retrieval).

TEDD, L. A. An introduction to computer based library systems. Chichester (UK), Wiley, 1984.
(textbook covering the broader field).

Practical guides

ARTHUR, A. (comp.) Quick Guide to Online Commands. London, Institute of Information Scientists, UK Online User Group, 1987. (Covers basic searching of BLAISE-LINE, BLAISE-LINK, Datasolve, DATA-STAR, DIALOG, DIMDI, ESA-IRS, SDC-ORBIT, Pergamon Infoline, Scicon, STN International and Telesystemes Questel. Mainly for UK users and compiled before some changes, for example the ORBIT-Infoline takeover. However, a handy guide which should be of use in other countries if two or more of the hosts listed are used).

CUADRA ASSOCIATES Directory of online databases Santa Monica, Cuadra Associates. (Quarterly updates).

FUINCA Bases de datos de economia y finanzas Madrid, FUINCA, 1985 (In Spanish).

FUINCA Introduccion a la teledocumentacion Madrid, FUINCA, 1982 (In Spanish).

FUINCA Catalogo de bases de datos espanolas Madrid, FUINCA, 1986 (In Spanish).

FUINCA Bases de datos del mundo Madrid, FUINCA, 1985 (In Spanish).

FUINCA Bases de datos iberoamericanas censo 1985 Madrid, FUINCA (In Spanish).

HALL, J. L. Online bibliographic databases. 4th ed. London, Aslib, 1986.
(Useful annotated listing of bibliographic databases)

ONLINE Inc. Online International Command Chart Online Inc, 1985. (Lists commands for 18 or so major US, Canadian and European hosts).

Computers and telecommunications basics relating to online information retrieval (4.2)

BURTON, P. F. Microcomputers in library and information services. Aldershot (UK), Gower, 1986. (Bibliography).

BURTON, P. F. and PETRIE, J. H. The librarians's guide to microcomputers for information management Van Nostrand Reinhold, 1986.

FOSDICK, H. Computer basics for librarians and information scientists Arlington (Va) Information Resources press, 1981.

ROWLEY, J. E. Computers for libraries 2nd ed. London, Bingley, 1984.

Free text and database management systems

ASHFORD, J. H. Information storage and retrieval systems on mainframes and minicomputers: a comparison of text retrieval packages available in the UK. Program 18 124-146, 1984.

ASHFORD, J. H. Storage and retrieval of bibliographic records: a comparison of database management system (DBMS) and free text approaches. Program 18 (1) 16-45, 1984.

BARKER, F. H. and TAYLOR, F. J. The use of the BASIS database management system to produce a highly current technocommercial database. Program 19 (4) 322-338, 1985.

BLASGEN, M. W. Data base systems. Science 215 869-872, 1982.

EASTMAN, C. M. Database Management Systems. Annual Review of Information Science and Technology 20 91-115, 1985.

KURTZ, L. A. An introduction to data base management systems. Program 18 (1) 1-15, 1984.

TAGG, R. M. Bibliographic and commercial data bases -contrasting approaches to data management with special reference to DBMS. Program 16 191-199, 1982.

Telecommunications

ALLEN, P. IPSS-online information worldwide 9th International Online Information Meeting Oxford, Learned Information, 313-321, 1985.

MEADOW, C. T. and TADESCO, A. S. Telecommunications for management New York, McGraw Hill, 1985.

Perspectives in telecommunications Journal of the American Society for Information Science 37 (6) 1986. (Series of articles).

Networks

CHEONG, V. E. and HIRSCHEIM, R. A. Local area networks: issues, products and developments Chichester, Wiley, 1983.

CHORFASS, D. N. Designing and implementing local area networks London, McGraw Hill, 1984.

COLLIER, M. Local area networks: the implications for library and information science. LIR Report 19, 1984. (British Library Library and Information Research Report).

COPELAND, J., FLOOD, S. and HAYNES, D. Applications of local area networks for information management: a practical evaluation. London, British Library, 1987. (British Library Research paper 10).

DESSINGTON, R. J. A practical guide to computer communications and networking 2nd ed. Chichester, Ellis Horwood, 1984.

GEE, K. C. E. Introduction to local area computer networks London, MacMillan, 1983.

HALSALL, F. Introduction to data communications and computer networks Wokingham, Addison-Wesley, 1985.

HOEY, P. O'N. In-house database services to widespread users over a network. 9th International Online Information Meeting. Oxford, Learned Information, 211-219, 1985.

LANE, J. E. Corporate telecommunication networks Manchester, National Computing Centre, 1984.

LEFKON, R. E. Selecting a local area network New York, American Management Association, 1986.

SCOTT, P. R. D. Reviewing your data transmission network Manchester, National Computing Centre, 1983.

SEGAL, J. A. Networking and decentralisation. Annual Review of Information Science and Technology 20 203-231, 1985.

STALLINGS, W. Local networks: an introduction London, Collier-MacMillan, 1984.

Information retrieval basics relating to online information retrieval (4.3)

(Some of the textbooks mentioned elsewhere cover this area e.g. Rowley J. Organising Knowledge))

BENNETT, P. A., JOHNSON, R., MCNAUGHT, J., PUGH, J. M., SAGERS, J. C. and SOMERS, H. L. Multilingual aspects of information technology Aldershot, Gower, 1986.

HEEKS, R. Personal bibliographical indexes and their computerisation. London, Taylor Graham, 1986.
(a nice introduction to different forms of indexing)

KIMBERLEY, R., HAMILTON, C. and SMITH, C. H. Text retrieval in context London, Taylor Graham, 1985.

VICKERY, B. C. and VICKERY, A. Information science in theory and practice London, Butterworth, 1987.

Information retrieval research

BELKIN, N. J. and VICKERY, A. Interaction in information systems: a review of research from document retrieval to knowledge-based systems. London, British Library (LIR Report 35) 1986.

SALTON, G and MCGILL, M. J. Introduction to Modern Information Retrieval. New York, McGraw Hill, 1983.

SPARCK JONES, K. Information Retrieval Experiment London, Butterworth, 1982.

VICKERY, B. C. and VICKERY, A Information science in theory and practice London, Butterworths, 1987.

WILLETT, P. Ranked output searching in textual and structural databases. 9th International Online Information Meeting Oxford, Learned Information, 343-354, 1985.

Record formats

NB This section contains some formats as well as some reading about them

AVRAM, H. D. UNIMARC version of MINISIS. IFLA Journal 11 (2) 120-127, 1985.

BRITISH LIBRARY UK MARC Manual, 2nd ed. London, British Library Bibliographical Services Division, 1980 onwards.

DIERICKX, H. and HOPKINSON, A. (eds) UNIBIB Reference Manual for machine-readable bibliographic descriptions. 2nd ed. Paris, UNESCO, 1981 (PGI/81/WS/20)

HOPKINSON, A. Standardizing data exchange: the UNESCO Common Communication format. 9th International Online Information Meeting. Oxford, Learned Information, 295-304, 1985.

IFLA. UNIMARC: Universal MARC format. 2nd ed. London, IFLA International Office for UBC, 1981.

INTERNATIONAL ORGANISATION FOR STANDARDIZATION. Documentation format for bibliographic information interchange on magnetic tape. 2nd ed. Geneva, ISO, 1981 (ISO 2709-1981).

TANNEHILL, R. S. Bibliographic and information processing standards. Annual Review of Information Science and Technology 18 61-98, 1983.

UNESCO GENERAL INFORMATION PROGRAMME and UNISIST. CCF: the Common Communication Format. Paris, UNESCO, 1984 (PGI-84/WS/4).

UNESCO. ISDS Manual, Paris, UNESCO, 1984.

UNESCO GENERAL INFORMATION PROGRAMME and UNISIST Reference Manual for machine-readable bibliographic descriptions 3rd ed. Paris, UNESCO, 1986. (PGI/86/WS/6).

AGRIS has some excellent instructional guides for record input, including a CAL package in several languages.

Searching using online services (4.4)

ARMSTRONG, C. J. and LARGE, J. A. Inhouse information retrieval on downloaded data. 9th International Online Information Meeting Oxford, Learned Information, 231-235, 1985.

AUSTER, E. User satisfaction with the negotiation interview: contemporary concern in traditional perspective. RQ 23 (1) 47-59, 1983.

BATES, M. J. Information search tactics. Journal of the American Society for Information Science 30 (4) 205-214, 1979.

BATES, M. J. The fallacy of the perfect thirty-item online search. RQ (Reference Quarterly) 24 (Fall) 1984.

FAULKES, J. Downloading bibliographic records Aldershot (UK), Gower, 1986. (Proceedings of a One Day Seminar sponsored by the MARC Users Group).
(Already rather dated)

FENICHEL, C. H. The process of searching online bibliographic databases: a review of research. Library research 2 107-127, 1980-1981.

FIDEL, R. Moves in online searching. Online Review 9 (1) 61-74, 1985.

FINER, R. Reference and enquiry work. In: Anthony, L. J. (ed.) Handbook of Special Librarianship and Information Work. London, Aslib, 1982.
(Not specifically online but an excellent practical guide to the reference interview).

FUINCA Distribucion y comercializacion de bases de datos Madrid, FUINCA, 1982 (In Spanish).

GARDNER, M. B. Are gateways the key to capturing the end user market? 10th International Online Information Meeting Oxford, Learned Information, 291-296, 1986.

GOLDSMITH, G. and WILLIAMS, P. W. Online searching made simple: a microcomputer interface for inexperienced users. British Library, 1986. (LIR Report 41 Library and Information Research Report)) (Microfiche).

GUHA, B. Study on the language barrier in the production, dissemination and use of scientific and technical information with special reference to the problems of the developing countries Paris, UNESCO General Information Programme and UNISIST, 1985. (PGI-85/WS/34).
(This touches on the problems of databases in relation to language).

HARRISON, I, HAMPEL, V. E. and KAWIN, R. A.. Downloading and post-processing of bibliographic information with the TIS intelligent gateway computer. National Online Information Meeting Medway (USA), Learned Information, 307-315, 1982.

HARTER, S. P. Online searching styles: an exploratory study. College and Research Libraries 45 (4) 249-258, 1984.

HARTER, S. P. Heuristics for online information retrieval: a typology and preliminary listing. Online Review 9 (5) 408-424, 1985.

HAWKINS, D. T. and LEVY, L. R. Front end software for online database searching. Part 1 Definitions, system features and evaluation. Online November 30-37, 1985. Part 2 The marketplace. Online January, 33-59, 1986. Part 3 Product selection chart and bibliography Online May, 49-58, 1986.
(A major survey of what exists in the United States. Part 1 particularly useful for teaching purposes).

MISCHO, W. H. and JOUNGHYOUN, L. End-user searching of bibliographic databases. Annual Review of Information Science and Technology 22 227-263, 1987.

RAMSEY, H. R. and GRIMES, J. D. Human factors in interactive computer dialog. Annual Review of Information Science and Technology 18 26-60, 1983.

VIGIL, P. J. The software interface. Annual Review of Information Science and technology 21 63-86, 1986.

TRENNER, L. and BUXTON, A. B. Criteria for user friendliness. 9th International Online Information Meeting. Oxford, Learned Information, 279-289, 1985.

FUINCA Inteligencia artificial para la gestion de bases de datos Madrid, Fuinca, 1986 (In Spanish).

Databanks (4.5)

BARTKUS, E. P. Use of numeric databases in reference and information services. Drexel Library Quarterly 18 (3-4) 205-219, 1982.

BERGER, M. C. and WANGER, J. Retrieval, analysis and display of numeric data. Drexel Library Quarterly 18 (3-4) 11-26, 1982.

CRONIN, B. Databanks. Aslib Proceedings 33 (6) 243-250, 1981.

ECKERSLEY, J. H. and RENNIE, J. S. Datastream-the use of a business databank. Journal of Information Science 8 (4) 171-180, 1984.

FRIED, J. B. and KOVACS, G. J. Numeric databases in the '80s. Drexel Library Quarterly 18 (3-4) 2-10, 1982.

FUINCA Bancos de imagenes Madrid, FUINCA, 1986 (In Spanish).

HAWKINS, D. T. The ManLab-NPL Materials databank. Online 3 40-52, 1979.

HELLER, S. R. NIH/EPA Chemical Information System (CIS) physical and chemical databases. Drexel Library Quarterly 18 (3-4) 39-66, 1982.

LUEDKE, J. A., KOVACS, G. J. and FRIED, J. B. Numeric bases and systems. Annual Review of Information Science and Technology 12 119-181, 1977.
(Although rather old now, this review has a useful definition of a numeric database system).

LUNIN, L. F. Electronic image information. Annual Review of Information Science and Technology 22 179-224, 1987. A useful review with an extensive section on applications.

MARTYN, J. Three specialised data centres. Aslib Proceedings 35 (6-7) 1983.

MESCHEL, S. V. Numeric databases in the sciences. Online Review 8 (1) 77-101, 1984.

UNESCO GENERAL INFORMATION PROGRAMME and UNISIST Guidelines for the organisation of short courses and workshops on the dissemination of data in science and technology. Paris, UNESCO, 1986. (PGI-86/WS/11).
(Contains an excellent introduction to data and databanks).

UNESCO GENERAL INFORMATION PROGRAMME and UNISIST Seminar on factual and numerical data banks (21-24 February, 1984, Rabat, Morocco) Final Report Paris, UNESCO, 1986. (PGI-85/WS/6.
(Contains useful basic information)

Full-text services (4.6)

JOHNSON, E. M and MYER, P. K. Online publishing: producing a full text encyclopedia. Electronic publishing bulletin 2 (1) 17-19, 1984.

LERNER, R. G., METAXAS, T., SCOTT, J. T., ADAMS, P. D. and JUDD, P. Primary publication systems and scientific text processing. Annual Review of Information Science and Technology 18 127-149, 1983.

POLLOCK, J. J. Quantification, retrieval and automatic identification of numeric data in organic chemistry journals. Journal of Chemical Information and Computer Science 24 (3) 139-147, 1984.

TENOPIR, C. Full text database retrieval performance. Online Review 9 (2) 149-164, 1985.

TENOPIR, C. Full-text databases. Annual Review of Information Science and Technology 19 215-246, 1984.

TERRANT, S. W., GARSON, L. R., MEYERS, B. E. and COHEN, S. M. Online searching: full text of American Chemical Society primary journals. Journal of Chemical Information and Computer Science 24 (4) 230-235, 1984.

WAGERS, R. The decision to search databases full text. 10th International Online Information Meeting Oxford, Learned Information, 93-107, 1986.

Videotex (4.7)

BORNSTAEDT, F. Von, Global developments for videotex. Data Processing 27 (8) 20-24, 1985.

BUSCAIN, A. Videotex systems and data access: a state of the art review. Aslib Proceedings 37 240-256, 1985.

CLARK, K. The design of a viewdata system. In: Winsbury, R. (ed.) Viewdata in Action New York, McGraw Hill, 1981.

DEW, R. The Prestel system and information retrieval. Program 14 76-89, 1980.

ERES, B. K., JACOB, B-S, SASLOVA, B and FENICHEL, H. A decision maker's guide to videotex and teletex. Paris, UNESCO, General Information Programme and UNISIST, 1986.
(An excellent introduction to the subject with examples drawn from many countries. Although directed at those planning to introduce videotex in a country, this report has a much wider application).

HAYDEN, V. Information scientists and librarians as a market for viewdata in the UK. Journal of Information Science 8 (4) 149, 1984.

HORNE, C. Gateway - an enhancement of Prestel. Aslib Proceedings 34 266-270, 1982.

JACOBS, C. H. Fourth generation videotex. Aslib Proceedings 37 (6/7) 273-276, 1985.

MACLEOD, A. Real-time videotex service. Data Processing 27 (8) 15-19, 1985.

PLAISTER, J. LASER and Prestel. Aslib Proceedings 33 343-350, 1981.

TUCK, W. R. Videotex and database management systems. Aslib Proceedings 38 (3) 85-92, 1985.

YATES-MERCER, P. A. Private viewdata in the UK Aldershot, Gower, 1985.

Other electronic publishing (4.8)

ANON. Electronic taste of the future. The Bookseller June 29th, 1985, 2617-2618.

AMY, S. J Teletex based electronic document delivery (Project Hermes). Journal of Documentation 41 (1) 15-23, 1985.
(Interesting, although the project was abandoned).

BROWNRIGG, E. B. and LYNCH, C. A. Electrons, electronic publishing and electronic display. Information technology and libraries 4 (3) 201-207, 1985.

DAY, M. P. Electronic publishing and academic libraries. British Journal of Academic Librarianship 1 (1) 53-70, 1986.

Electronic publishing corporate and commercial publishing. Proceedings of a conference held in London, November, 1985. London, Online International, 1985.
(Likely only to be of 'historical' interest -contains papers on graphics handling, corporate electronic publishing, CD-ROM, video discs and laser cards)

GATES, Y. User needs and technology options for electronic document delivery. Aslib Proceedings 35 (4) 195-205, 1983.

KIRCZ, J. G. and BLEEKER, J. The use of relational databases for electronic and conventional scientific publishing. Journal of Inforation Science 13 (2) 75-90, 1987.

JENKINS, J. The management of electonically prepared manuscripts. The Bookseller August 31st, 1985, 923-926.

LINE, M. B. Redesigning information packages for electronic transmission. In: K. O. Jones and H. Taylor, (ed.) Informatics 6 The Design of Information Systems for Human Beings, London, Aslib, 1981.

LINE, M. B. Document delivery, now and in the future. Aslib Proceedings 35 167-176, 1983.

LINE, M. B. On demand and online publishing: lifeline, death knell or irrelevant? The Bookseller June 29th 1985, 2629-2631.

OAKESHOTT, P. Publishing for tomorrow's market. The Bookseller July 6th 1985 39-40.

PULLINGER, D. The BLEND network and electronic journal project. Program 18 (3) 263-264, 1984.

SCHLESINGER, K. Electronic publishing - its impact on the retail trade. The Bookseller December 7th 1985, 2291-2292.

STERN, B. ADONIS-publishing on CD-ROM in mixed mode. 10th International Online Information Meeting Oxford, Learned Information, 23-31, 1986.

TEAGUE, S. J. Microform, video and electronic media librarianship London, Butterworth, 1985,
(Perhaps useful from the point of view of maintaining a collection in this area).

Video discs including CD-ROM

CAWKELL, A. E. Optical disk categories Journal of Information Science 13 (1) 35-36, 1987.
(a short note expanding on the article by Rivett)

CLARKE, A. The British Library's compact disc experiment. London, British Library, 1986. (ISBN 0 7123 3086 0).

HEDLEY, T. An introduction to CD-ROM (Compact Disc Read Only Memory) Information Media and Technology 19 (3) 103-106, 1986.

HORDER, A. Videodiscs-their potential for information storage and retrieval. Reprographics Quarterly 12 (3) 46-48, 1980

LORD, P. W. Progress in CD-ROM standardisation. 10th International Online Information Meeting Oxford, Learned Information, 256-261, 1986.

MOORE, N. L. LISA on CD-ROM - leading the way. Library Association Record 89 (5) 237-238, 1987.
(Short popular article).

OPPENHEIM, C. Information managers guide to CD ROM and optical publishing London, Butterworths, 1988.

RIVETT, M. Videodiscs and digital optical disks Journal of information Science 13 (1) 25-34, 1987.
(Excellent account of the technology)

SCHWERIN, J. B. with HENDLEY, A. International Initiatives for CD-ROM standards. Oxford, Learned Information, 1986.
(will date quickly, but has some basic factual information).

VAUGHAN, K. The CD-ROM as a publishing medium, the crystal ball approach. 10th International Online Information Meeting Oxford, Learned Information, 271-281, 1986.

WILLIAMS, B. J. CD-ROM: a new medium for publishing. Information Media and Technology 19 (3) 107-109, 1986.

Artificial intelligence and expert systems (4.9)

BELKIN, N. J. and VICKERY, A. Interaction in information systems: a review of research from document retrieval to knowledge-based systems. British Library, 1986. (LIR Report 35 Library and Information Research Report).

BORK, H. Getting started in library expert systems research. Information Processing and Management 23 (2) 81-88, 1987.

BROOKES, H. M. PLEXUS - an expert system for referral. Expertise (2) 1-7, 1986.

CLARKE, A. and CRONIN, B. Expert systems and library/information work. Journal of Librarianship 15 277-292, 1983.

DAVIES, R. Outlines of an emerging paradigm in cataloguing. Information Processing and management 23 (2) 89-98, 1987.

EDMONDS, E. Expert systems and document handling. Information Processing and Management 23 (2) 77-80, 1987.

FORD, N. How machines think: a general introduction to artificial intelligence, illustrated in PROLOG. Chichester, New York, Wiley, (ISBN 0 471 91139 9) 1987.
(An introductory text).

KEHOE, C. A. Interfaces and expert systems for online retrieval. Online Review 9 (6) 489-505, 1985.

LARSEN, G. Intelligent gateways: evaluation of EASYNET-an end-user test. 10th International Online Information Meeting Oxford, Learned Information, 131-135, 1986.

MACKAY, R. Software requirements of online users. 10th International Online Information Meeting Oxford, Learned Information, 297-305, 1986.

PARRISH, J. Expert systems at the US National Archive. Expertise (2) 7-10, 1986.

POLLITT, S. CanSearch an expert systems approach to document retrieval. Information Processing and Management 23 (2) 119-138, 1987.

SMITH, L. C. Artificial intelligence and information retrieval. Annual Review of Information Science and Technology 22 41-77, 1987.

SOWIZRAL, H. A. Expert systems. Annual Review of Information Science and Technology 20 179-199, 1985.

VICKERY, A and BROOKS, H. M. PLEXUS-the expert system for referral. Information Processing and Management 23 (2) 99-118, 1987.

VICKERY, A., BROOKS, H., ROBINSON, B. and VICKERY, B. C. A reference and referral system using expert system techniques. Journal of Documentation 43 (1) 1-92, 1987.

WEBBER, S. Are you suffering from blinkered front ends? 10th International Online Information Meeting Oxford, Learned Information, 185-197, 1986.

WILLIAMS, P. W. The design of an expert system for access to information. 9th International Online Information Meeting Oxford, Learned Information, 23-29, 1985.

Inhouse databases, design, construction and use (4.10)

BARKER, F. H. and TAYLOR, F. J. The use of the BASIS database management system to produce a highly current technocommercial database. Program 19 (4) 322-338, 1985.
(Interesting use of a DBMS to produce a current awareness publication and database).

BAWDEN, D. Ten years of online information for pharmaceutical research. 10th International Online Information Meeting. Oxford, Learned Information, 63-67, 1986.

BOYALL, L. and FURNEAUX, M. Progress in computerising May and Baker's agricultural information services. 10th International Online Information Meeting. Oxford. Learned Information, 83-91, 1986.

CRAFTS-LIGHTY, A. The successful development of a commercial information product from an inhouse bulletin. 10th International Online Information Meeting. Oxford, Learned Information, 77-82, 1986.

DAVISON, B. J. and WILSON, P. L. How to get your own information services database up and running: practical steps for the small organisation. 9th International Online Information Meeting. Oxford, Learned Information, 221-229, 1985.

EAST, H. Designing and marketing inhouse databases. (British Library Research Paper 7) London, British Library Board, 1986.
(An excellent basic guide).

FRANCIS, G. M., MULLINGS, C. and WILSON, T. D. A manual for the evaluation of current awareness bulletins London, British Library, 1981. (BL R and D Report 5484).

FORD, S. and MARK, R. ADLIB - its use by the Greater London Council research library. Program 19 (4) 339-350, 1985.

HEEKS, R. Personal bibliographic indexes and their compterisation London, Taylor Graham, 1986.
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(Old paper but the clear arguements presented are worth study)

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(Some consideration of the problems and many case studies of the introduction of microcomputers usually for office automation or project management but nonetheless interesting, since it is important that information workers do not take too narrow a view of information handling. A potentially useful source for contacts and visits)

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(Although old and slanted towards the European situation, this paper is still useful in pointing out the economic factors involved in online).

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HAUPT, A-C. Online bibliographic databases and user education at Lulea University of Technology IATUL Quarterly 1 (1) 41-44, 1987.

Online sources for particular subjects (4.17)

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EISENSCHITZ, T. S. Patents, trade marks and designs in information work Beckenham, Croom Helm, 1987.

GROGAN, D. Science and technology an introduction to the literature. 4th ed. London, Bingley, 1982.
(Good textbook on sources of information -has a chapter on computerised data bases. A new edition is awaited).

LAMBERT, J. and LAMBERT, P. A. How to find information in science and technology London, Bingley, 1986.

PARKER, C. C. and TURLEY, R. V. Information sources in science and technology. 2nd ed. London, Butterworths, 1986.
(a guide to sources of information including computerised sources).

And guides to the literature of particular subjects, comparisons of relevant databases, etc.

Sources of business information

BUTCHER, H. Sources of information for corporate investigations. Accountants' Digest 199 1-48, 1986.

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VERNON, K. D. C. ed. Information sources for business and management London, Butterworth, 1986.

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ASH, J. et al Communication, storage and retrieval of chemical information Chichester, Ellis Horwood, 1985.

BARNARD, J. Computer handling of generic chemical structures Aldershot, Gower, 1984.

BOTTLE, R. T. Use of the chemical literature 3rd ed. London, Butterworth, 1979.

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AIOPI and UKOLUG Chemical toxicology searching - a guide to sources May 1980.

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BAWDEN, D. and BROCK, A. Chemical toxicology searching: a collaborative evaluation, comparing information resources and searching techniques Journal of Information Science 5 (1) 3-18 1982.

COSTIGAN, A., WOOD, F. E. and BAWDEN, D. Comparison of search techniques (printed and computerised) with specific reference to the RTECS databank Journal of Information science 10 79-86 1985.

EGER, A. J. Looking for information on carcinogenic properties of chemicals Database 55-61 1982.

PANTRY, S. Health and Safety London, Capital planning Information, 1983.

PANTRY, S. Information sources for occupational health nurses Sheffield, SCP Publishing, 1986.

ROYAL BOTANIC GARDENS, Kew Library and Archives Division Poisonous plants: selected references (Bibliography No. 2)

WEXLER, P. Information resources in Toxicology New York, Elsevier, 1981.

WOOD, F. E. The use and availability of occupational health information: results of a study Journal of Information Science 9 141-151 1985.

WOOD, F. E., RUBIN, V. and THOMAS, S. Information for occupational medicine, occupational health and related fields: some results of a study. Health Libraries Review 4 63-74 1987.

Sources of information for agro-industry

CRAIG, G. M. Information systems in UK agriculture: final report of the Agriculture Information Review Committee Aslib Proceedings 32 (5) 201-206, 1980.

DESELAERS, N. The necessity for closer cooperation among secondary agricultural information services: an analysis of AGRICOLA, AGRIS and CAB Quarterly Bulletin IAALD 31 (1) 19-26, 1986.

FRANK, R. C. Agricultural information systems and services. Annual Review of Information Science and Technology 22 293-334, 1987. (Concentrates on the United States but some international services are included)

GOERS, W.G. Agribusiness USA Database 9 57-60, 1986.

LILLEY, G. P. Information sources in agriculture and food science London, Butterworth, 1981.

MANN, E. J. Past, present and future developments in the transfer and dissemination of agricultural information: the case for a single co-ordinated world agricultural information system. Quarterly Bulletin IAALD 31 (1) 5-9, 1986.

OLIVEIRA, S. Marques de. A comparative study of two agricultural literature journals: Bibliography of Agriculture and Abstracts on Tropical Agriculture. Quarterly Bulletin of IAALD 29 (1) 11-15, 1984.

PALMER, J. Information services in a beleaguered agricultural industry Aslib Proceedings 38 (4) 101-113, 1986.

POSNETT, N. W.The value of non-conventional literature in tropical agricultural development (Paper presented at: Annual Conference Development Studies Association, University of East Anglia, Norwich, Uk, 15-17 September 1986.).

READ, N. The advisory role and changes in agricultural information Aslib Proceedings 39 (1) 33-39, 1987.

RENEAU, F. and Patterson, R. Comparison of online agricultural information services. Online Review 8 (4) 313-322, 1984.

RESENDE, R. Current situation of agro-industry development and identification of co-opertion areas in some selected Latin American countries Geneva, UNIDO 1985 (UNIDO/PC 120 2 August 1985).

SNOW, B. Database selection in the life sciences Database August 15-46, 1985.

TURCO, M. Agricultural information a brief guide to sources on developing countries Syracuse, FID/ET Clearinghouse, 1986.

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Appendix III

INFORMATION FOR PRACTICAL ONLINE INFORMATION RETRIEVAL TEACHING

Contents

Tools for selecting software including teaching aids 2

Guides to online databases 2

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Some examples of computer assisted learning packages 4

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Tools for selecting software including teaching aids

DAY, J. M., KEMP, D. A. and TEDD, L. A. CALLISTO: a directory of new technology in use in UK schools of library and information studies. (British Library R and D Report No. 5801) Newcastle upon Tyne, Newcastle upon Tyne Polytechnic Products, 1984 and Supplement 1985.
(The main use of this guide is to identify library schools which might have teaching packages available. The listing of teaching packages itself, although regularly updated, does not contain the latest information).

DYER, H. AND BROOKES, A. A Directory of Library and Information Retrieval Software for Microcomputers. 2nd ed. Aldershot (UK), Gower, 1986.
(Software listing, includes an index of functions, does not include CDS/ISIS).

HOWDEN, N. and BOYCE, B. R. The use of CAI in the education of online searchers Journal of Education in Library and Information Science 28 (3) 201-206, 1988.

KEREN, C and SERED, I. International Inventory of software packages in the information field Paris, UNESCO General Information programme and UNISIST, 1983 (PGI-83/WS/28).
(Out of date but 2nd edition being prepared by Learned Information).

KIMBERLEY, R. with ROWLEY, J. Text retrieval: a directory of software. Aldershot (UK), Gower, 1987.
(An excellent compilation with comparisons of the packages).

RASDALL, M. CD-ROM products. London, Alan Armstrong, 1986.
(A listing of databases available on CD-ROM but already out of date).

STANTON, E. How to go online. Cleveland (UK), Headland, 1986.
(A guide to equipment for online searching. It costs £49.95 and UK biassed).

The FID/ET Clearinghouse for Information Education and Training Materials, c/o School of Information Studies, Syracuse University, Syracuse, New York State 13244-2340, USA is a potential source of information on teaching aids.

The User Education Centre, c/o Ian Malley, University Library, Loughborough University of Technology, Loughborough, UK is another potential source of information.

Guides to online databases

CUADRA ASSOCIATES. Directory of online databases. Santa Monica, Cuadra Associates. (Quarterly).

HALL, J. L. Online Bibliographic Databases. 4th ed. London, Aslib, 1986.

Setting up an online search service

TURPIE, G. Going online. London, Online Information Centre, Aslib, 1987.
(Basic help- describes the UK situation).

KEENAN, S. How to go online. Guidelines for the establishment of an online service. London, British Library, 1980. (British Library Research and Development Report 5533).
(Dated and slanted towards the UK situation but still possibly useful).

Some examples of computer assisted learning packages to teach online searching

These examples are given to illustrate the teaching programs available.

TESS and TESS (SCIENCE)

These two microcomputer based simulations of DIALOG searching were produced at the Department of Information Studies, University of Sheffield (UK). They can be run on Apple II or IBM PC microcomputers. The user is guided through set searches, which if searched in sequence gradually introduce new commands or system features and increase in complexity. If the user makes a mistake in input he or she is informed and (after three attempts) told what the correct input should be. The searches in TESS are social science searches for example, on "Industrialisation in developing countries from an employment perspective" whilst those in TESS (SCIENCE) are on science or engineering topics for example, "Radioactive waste disposal and its effect on the environment" but subject knowledge is not necessary to use either of the simulations.

Further information is available from F. E. Wood, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN, UK.

DIAL-SOS

This is a simulation of DIALOG searching produced at the Department of Information Studies, University of Sheffield. It is similar to TESS (SCIENCE) in its modular form and science based searches but has in addition a self assessment module. The version used in Sheffield is minicomputer based so several terminals can be connected at any time.

An IBM PC version is also available which replaces TESS (SCIENCE).

Further information is available from F. E. Wood, Department of Information Studies, University of Sheffield, Sheffield S10 2TN, UK.

O. S. T. (Online Search Tutor) Junior

This is a self contained package produced at the College of Librarianship, Wales. It runs on an IBM-PC XT with a minimum of 256K RAM and a 10 Mbyte fixed disk or compatible. It has 8 "lessons" which have a variety of forms :- instruction (reading and watching examples, with tests), demonstration (where a search is shown and explained) and interactive demonstration (simulation).

Further information is available from Dr J. A. Large, College of Librarianship, Wales, Aberystwyth, Wales.

QUESTSIM

Computer assisted learning package to teach searching ESA-IRS databases. Runs on an IBM PC. A nice package with rather greater sophistication than some simulations. Avaiable from Cliff Weinmann, Information technology Centre, Chalmers University of Technology, The Library, S-41296 Goteborg, Sweden.

EMAO

Ms M. Wolff-Teroine, PEGASOS, 43 La Bruyere, 75009 Paris, France has produced an interesting French language package called EMAO to teach online searching using cooking as the subject of the searches.

INSTRUCT

This is an interactive computer program which demonstrates some of the features that have been suggested for the online retrieval systems of the future but which are not used to any great extent by present commercial online search systems. INSTRUCT has facilities for natural language query processing including use of a stop word list, a stemming algorithm, a fuzzy matching routine that allows automatic identification of a range of word variants, the provision of ranked output using automatic term weighting and a nearest neighbour searching procedure, and automatic relevance feedback using probabilistic relevance techniques. The program can be menu driven by those with little or no online search experience or command driven by those with more experience. The database is several years (1982 onwards) of the LISA (Library and Information Science Abstracts) records (title, abstract and accession number).

Further information is available from Dr P. Willett, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN, UK.

HENDRY, I. G., WILLETT, P. and WOOD, F. E. INSTRUCT: a teaching package for experimental methods in information retrieval. Part I The users' view. Program 20 (3) 245-263, 1986.

HENDRY, I. G., WILLETT, P. and WOOD, F. E. INSTRUCT: a teaching package for experimental methods in information retrieval Part II Computational aspects. Program 20 (4) 382-393, 1986.

CHEMLEARN

Interactive microcomputer demonstration of CHEMLINE, TOXLINE, RTECS, HSDB and CCRIS files. Runs on IBM-PC, PC-XT and PC-AT and fully compatible computers. Needs 256K RAM, one disk drive and DOS 2.0 or higher.

Available from NTIS (Order no PB87-143327/GBB) for $15.00 ($30.00 overseas plus $4.00 postage and handling fees) or £85 in UK from Micro Info). NTIS, US Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161, USA.

STN Mentor

Four discs produced by STN to teach some of the facilities of their databases. The discs are Overview, Searching CAS online, Spotlight on Authors 1 and Focus on Semiconductors. Although scientific, the first in particular, could be useful as a general introduction to online searching. The discs are mainly explanatory but contain some simulation of online searching.

The discs are free and run on an IBM PC or 100% compatible computer. Further information from STN-Columbus, c/o Chemical Abstracts Service, PO Box 02228, Columbus, Ohio 43202, USA.

TRAGIC

A. Lebowitz has produced a multi-language CAL programme to teach AGRIS indexing. For information contact A. Lebowitz, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

Demonstration expert system

ESIE (Expert System Inference Engine) Has several demonstration expert systems of which Animal and Doctor seem the most suitable for general users. This shareware costs $75 although users are invited to pay what it is worth to them. It is available from Lightwave Consultants, PO Box 290539, Tampa, FL 33617, USA.

Audiovisual materials

Online Information

#35 (plus VAT, if applicable),
Available from:- Betty Walters, Hatfield Polytechnic Library, Hatfield, Hertfordshire, AL10 9AD, UK.
VHS, Umatic, UK TV standard, 13 minutes.
(A good introduction).

BRS have produced a video training course in three parts. Part one covers the basics, equipment requirements, logging on, selecting databases, etc, part 2 a more detailed look at carrying out an online search and part 3 covers special search features on BRS.
Price: $245 for all three parts or $95 each.
(Source Online Notes February, 1987).

The Answer's On-line

1986. Video (VHS and Betamax) and tape/slide. Produced by the British Council and available at many British Council offices. Good basic introduction. About 25 minutes.

Appendix IV

GLOSSARY OF TERMS USED IN THE GUIDELINES

NOTE: The definitions given are not intended as formal definitions but simply as brief indications of meaning to help readers who are unfamiliar with the vocabulary of online searching. To keep this glossary to an acceptable size general computer, telecommunications and information retrieval terms have been omitted.

Authoring software

This makes the preparation of computer assisted learning packages easier.

Best match searching

Relevance is assumed to be a relative and continuous value and search results are ranked according to their similarity to the query. This is in contrast to Boolean searching in which items either match or do not match the search query. Boolean searching is sometimes called partial match searching.

CD-ROM see Compact Disk - Read Only Memory.

Character coded

Alphanumeric characters are recorded using a character set, in contrast to image coding where the actual appearance of the page is recorded. For example, telex is character coded and facsimile is image coded.

Citation searching

Using citation indexes or their online equivalents to search for references to documents which cite a known document or author's work.

Command language

Language in which the searcher instructs the host computer in online searching. This is usually a rigid form of simplified English and command languages differ from host to host. Some hosts have, in contrast, menu driven systems.

Compact Disk - Read Only Memory

Small (12 cm) videodiscs on which large (540 megabytes) amounts of data can be stored. Once a disc has been produced it is not possible to add any extra data to it.

Databank

A machine readable and searchable collection of data. The term is often used in preference to the term database when factual or numerical information is stored.

Database

A machine readable and searchable collection of data especially bibliographic references.

Hybrid databases have both numeric or factual information and bibliographic references.
An inhouse database is one produced by the organisation in which it is searched. The term is sometimes used also for a database obtained from another organisation but mounted on a computer within the organisation.
A numeric database system consists of a numeric database (or databank), retrieval software and also programs to manipulate the data retrieved.
Referral databases give an indication where information may be found rather than the information itself. They include bibliographic databases and reference databases, for example, machine-readable directories.
Remote databases are those mounted on computers which are outside the organisations doing the searching.
Source databases give information rather than just indicating where it can be found. They are the opposite of referral databases. Source databases are of the following types:- numeric, factual or full-text.

Database mamagement system (DBMS)
A generalised tool for manipulating large databases.

DBMS see Database management system.

Digitiser
Equipment to convert images on paper into machine-readable form.

Downloading
Taking the results of an online search in machine-readable rather than paper form.

Emulation
Used in the Guidelines for a computer assisted learning package consisting of a database and search software which resembles that of a specific online host.

End user
A person other than a librarian or information worker who does his or her own searching for information.

Expert system
A computer system which is designed to carry out tasks normally undertaken by human experts in a particular field.

File
A logically organised collection of data records.
In serial files the records are arranged one after another in sequence.
Inverted files contain sorted entries to speed searching.

Free-text retrieval
Each entry is a single flexible record with field markers. Entry is through an inverted file. The search language is part of the system.

Front end
Software that does the logging on to the online system automatically and then simplifies the searching process. Some are considered to behave intelligently.

FTX see free text retrieval.

Full-text
The complete text of the documents is stored and searchable.

Gateway
1. A facility which allows the searcher whilst online to one online service to connect through it to another online service.
2. Interface which automatically dials the telephone and connects the user to the online service.

Hands-on
Actual use.

Host
An online service such as Dialog.

Image bank
A databank in which visual images are stored.

Image coded
The reverse of character coded (see above).

Inference engine
The computer programs which run an expert system.

Information industry
Database producers, other publishers, online hosts and all involved in the commercial aspects of the information field.

Interactive videodisc
Videodisc which is used to store data (usually multimedia, for example, text, still photographs and video) with computer software for searching. Can be used as the data store for a computer assisted learning package.

Interactive videotex see videotex.

Intermediary
A person who searches for information (usually online) for another person who needs it.

Inverted file see File.

IR - abbreviation for Information Retrieval.

Keyboard skills
Typing, word processing.

Knowledge base
The store of expert knowledge in an expert system.

LAN see local area network.

Local area network (LAN)
Network linking computers and their peripherals over a limited area such as within one organisation which is in one location.

Menu driven
The user is offered a range of options from a list (menu). This is an alternative to using a command language (see above) for searching (or other use of a computerised system).

Online
Being connected to a computer via a terminal or another computer.

Online public access catalogue (OPAC)
A library catalogue on a computer which library users can search via a terminal or microcomputer.

OPAC see Online public access catalogue.

Partial match see best match.

Phrase indexing
Indexing where a phrase is indexed as a whole rather than some of the individual words within the phrase being indexed.

Prolog
A programming language suitable for expert systems.

Ranked output
Form of output in best match searching (see above).

Reference interview
Interview with a person who wants information, especially if an extensive search is required to find it.

Relative recall
A means of comparing the retrieval performance of actual databases where the total number of 'relevant' references in each database is unknown. Takes the total number of relevant references in all the databases searched as the basis for comparison.

Relevance feedback
A means of possibly improving the performance of best match searches by using information based on the searcher's relevance judgements to re-rank the results.

Rule based
One method of structuring the knowledge in an expert system.

Search interview see Reference interview

Search strategy
The way in which a search is to be carried out. The detailed plan for a search.

Semantic net
A method of structuring the knowledge in an expert system.

Serial file see File

Shell
An empty expert system to which a knowledge base can be added.

Simulation
Used in the Guidelines for a computer assisted learning package which is based on real online searches which the user is guided through. There is no database.

Teletex
A CCITT term for a system that transmits data between work stations such as word processors. Combines text editing with high speed (1200 bps or higher) telex facilities.

Teletext see Videotex.

Transborder data flow
The transfer of information in machine-readable form across national borders.

Truncation
Shortening words in online searching, for examples to search for singular and plural terms together.

Uploading
Sending input whilst online to an online service which has been prepared and stored locally in machine-readable form.
User profile
A formalised statement defining the users of a service.

Videotex
A communication system in which digitally encoded frames a transmitted for reception by a modified TV set (or microcomputer)

where a limited number of frames are stored and displayed. There are two main types:-

Teletext (broadcast videotex) employing one way communication. Most systems use the TV signal for transmission and insert the information in the interframe blanking.
Interactive videotex (viewdata or just videotex) Employs two way communication and the signal is sent by telephone.

Word indexing
Each significant word in a phrase is indexed separately. (See phrase indexing).

WORM (Write Once Read Many times)
A form of videodisc which allows the one addition of information after the disc has been made.

APPENDIX V

ACRONYMS AND ABBREVIATIONS

(which do not appear in Appendix IV)

NOTE: These are not formal definitions but simply indications of the meanings to enable the reader to follow the text even if unfamiliar with some of the acronyms and abbreviations used.

ADONIS	An experiment in electronic publishing being undertaken by several biomedical publishers and major inter-lending libraries. Full-text of journals is distributed to the libraries on CD-ROM. They satisfy loan requests by laser printing papers from the CD-ROMs.
AGRIS	International agricultural information system of the Food and Agriculture Organisation (and its database).
ARRTEL	British Library automated loan request service.
ASCII	American Standard Code for Information Interchange American (and internationally used) character set for computers which it relates to the binary operations of the computer.
BEILSTEIN	Beilstein's Handbuch der Organischen Chemie (and the online version). A major chemical reference work.
BIOSIS	The Biological Information Service which produces Biological Abstracts, Zoological Record and their online equivalents.
BLCMP	A British catologuing service which distributes machine readable catalogue records.
CAL	Computer Aided Learning sometimes called Computer Aided Instruction (CAI)
CDS/ISIS	UNESCO database creation and retrieval software
CCITT	Comite Consultatif International de Telegraphie et Telephonie. International organisation responsible for standardisation in the telecommunications field.
CEPIS	Centro Panamericana de Ingenieria Sanitaria
CODATA	International organisation for data activities.
Datastream	A major financial databank

Dialog	Largest online host.
Dialnet	Dialog telecommunication network.
Dialorder	Online document ordering system on Dialog.
Domesday project	Interactive videodisc which provides multimedia information about England produced to celebrate the 1000th anniversary of the original Domesday Book which was an inventory of all settlements in England.
EBSIDIC	European equivalent of ASCII code.
ERIC	Educational Resources Information Centre (and the online database it produces).
ESIE	Expert System Inference Engine. Shareware with demonstration expert systems.
GMELIN	Gmelins Handbuch der anorganischen Chemie. Major chemical reference work and the online equivalent.
ICIPE	International Centre for Insect Physiology and Ecology.
ILCA	International Livestock Centre for Africa.
INSPEC	Database producer of Physics Abstracts, Electrical and Electronic Abstracts and Computer ond control Abstracts, etc. Online database is also called INSPEC.
ISO	International Standards Organisation.
JANET	UK joint universities telecommunications network (not exclusively university).
LEXIS	A legal full-text database.
LIS	Library and information studies.
MARC	MAchine Readable Cataloguing. Cataloguing standard.
MEDLINE	A medical database produced by the National Library of Medicine.
Mycin	A medical expert system.
OCLC	An online cataloguing service.

OKAPI	An online public access catalogu produced by the Polytechnic of Central London (UK).
PADIS	The Pan-African Development Information Service.
PC	Personal Computer.
POLIS	Online database of Parliamentary information (UK).
PSIDOM	Software for the direct input of chemical structures (by drawing them).
PSS	Packet Switchstream. UK packet switched service.
STN EXPRESS	Software for direct input of chemical structures to the STN online services.
UN (Habitat)	United Nations organisation for human settlements.
UNESCO	United Nations Educational Scientific and Cultural Organisation.
VDU	Visual Display Unit.
WLN	Washington Library Network (catalogue system NOTIS).

PGI STUDIES AND DOCUMENTS IN THE FIELD

OF EDUCATION AND TRAINING

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Copies of the above studies and documents are available from:
Division of the General, Information Programme, UNESCO, 7, Place de Fontenoy, 75007 PARIS, France

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